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THE LANCET

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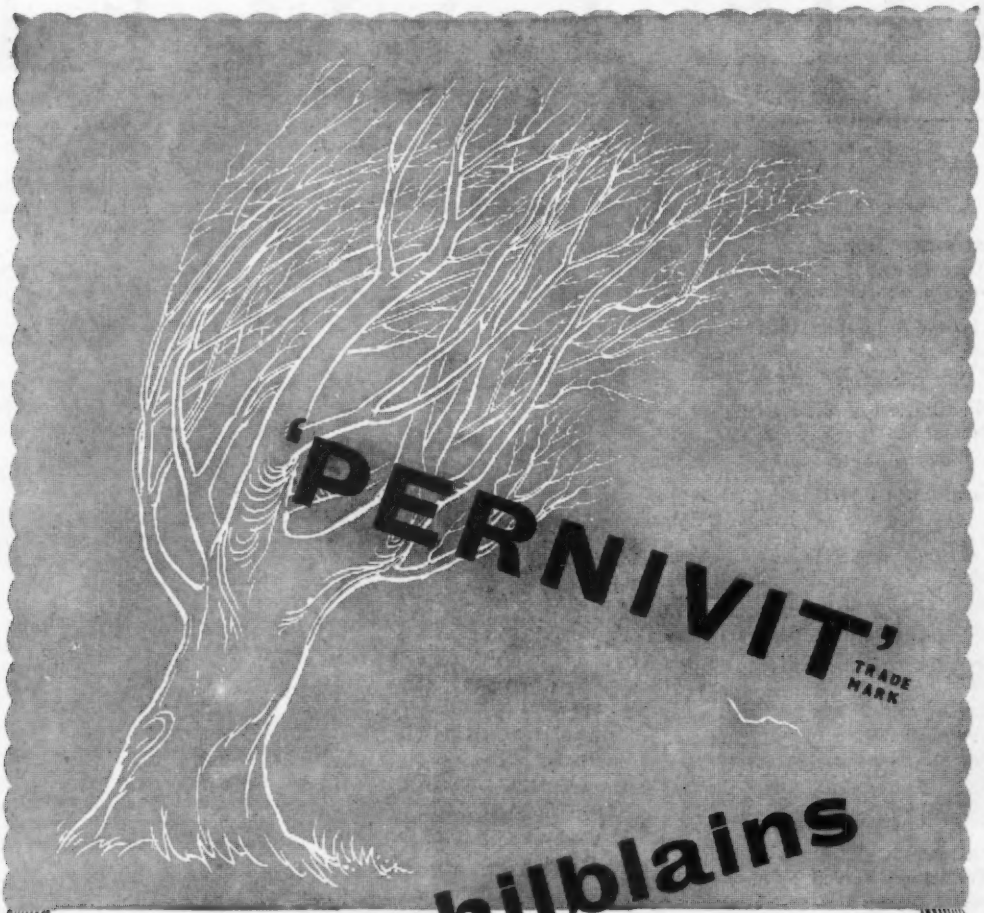

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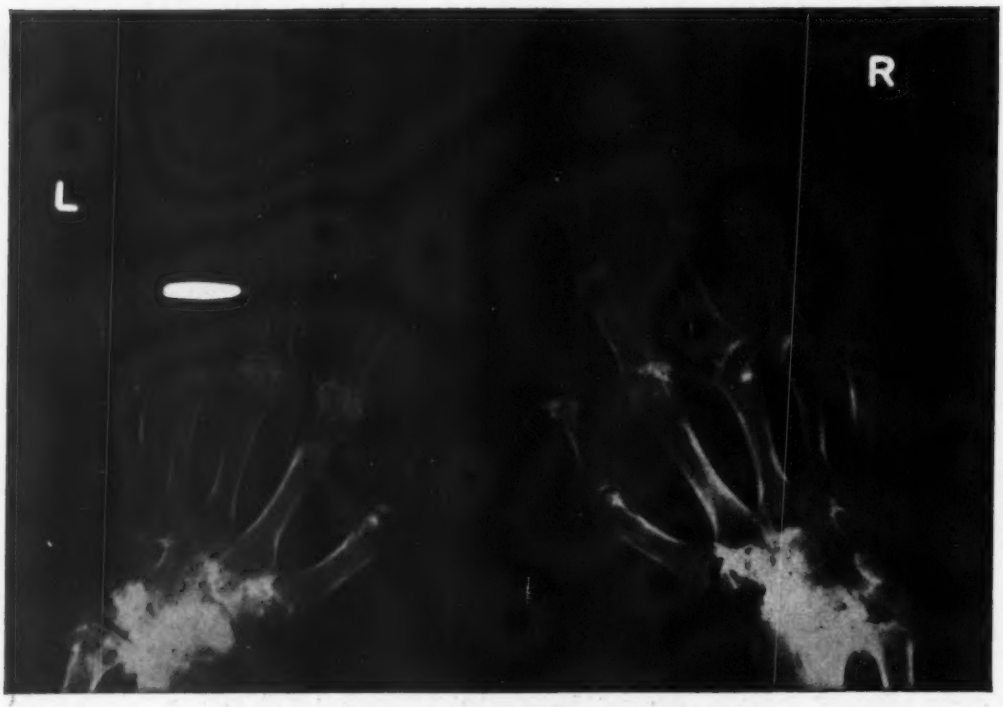

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3 (*In Vitro Differences Between Dihydroxy Aluminium Aminoacetate and Dried Aluminium Hydroxide Gel, J. Am. Pharm. Assoc., Sc. Ed. 41:361 (July) 1952.*)

4 (*Effect of Buffering Agents on Absorption of Acetylsalicylic Acid, J. Am. Pharm. Assoc., Sc. Ed. 39:21 (Jan.) 1950.*)

5 (*The Pharmacologic Principles of Medical Practice, ed. 3, Balto., The Williams & Wilkins Company, 1954, p. 593.*)

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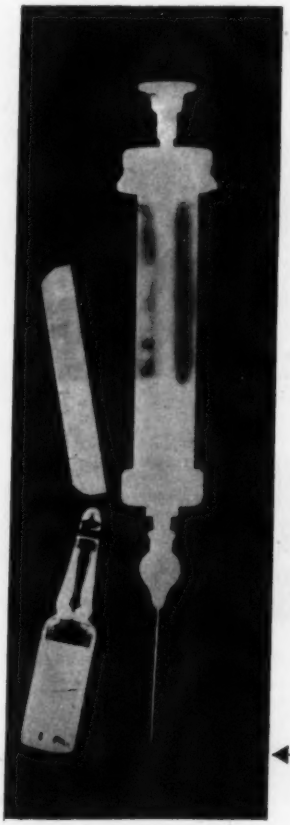

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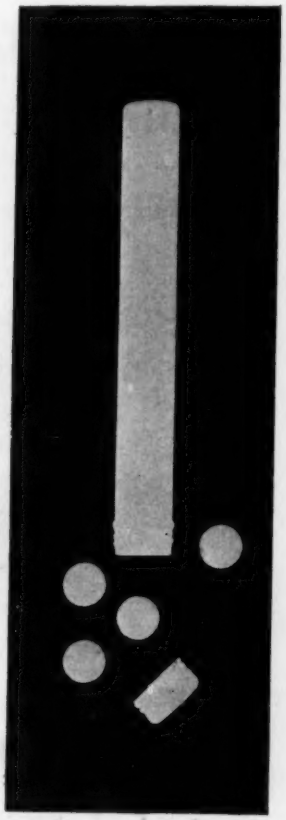

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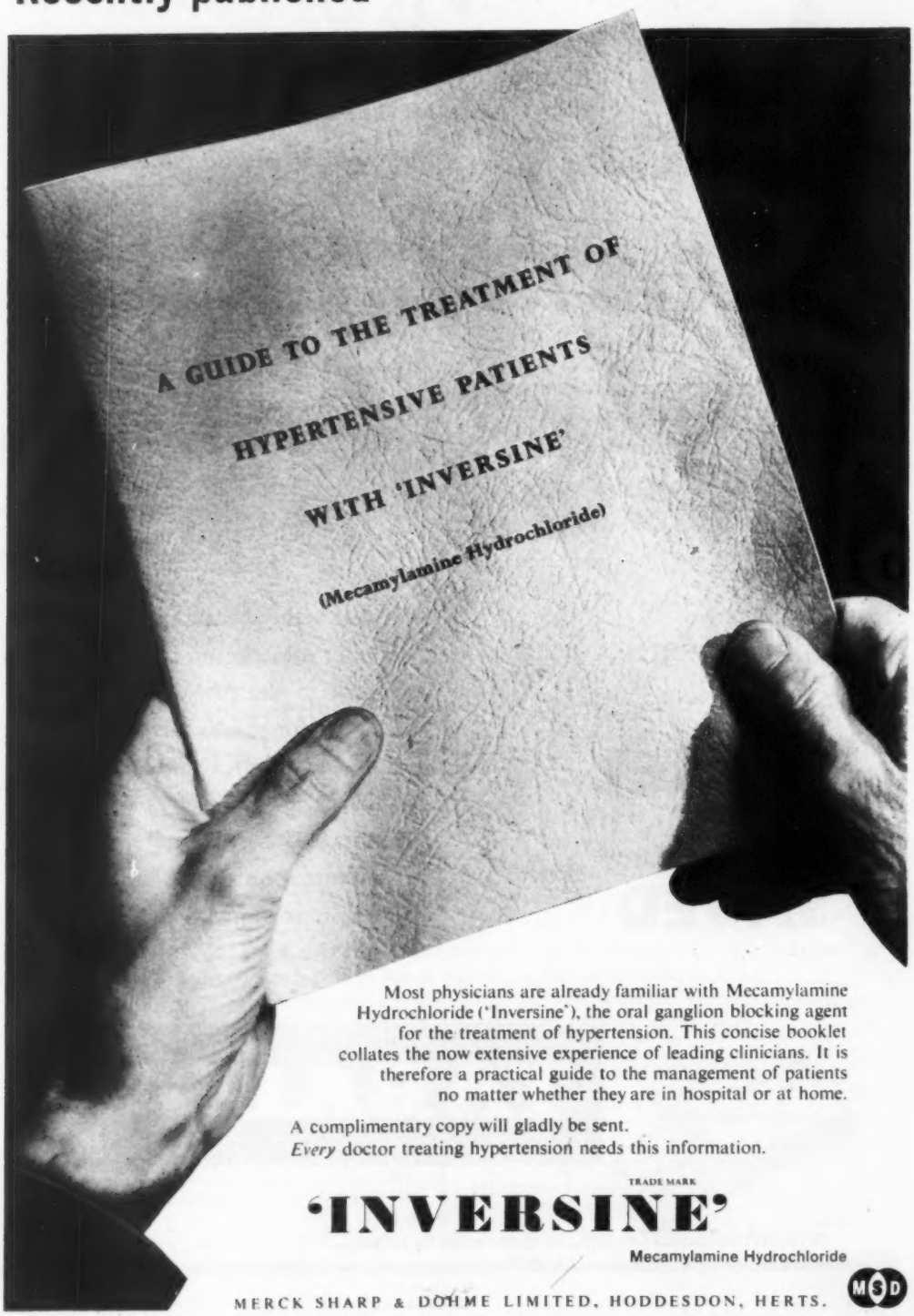

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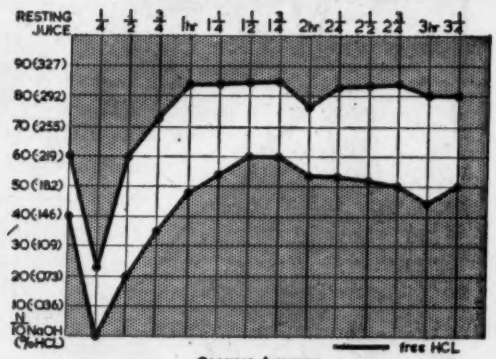

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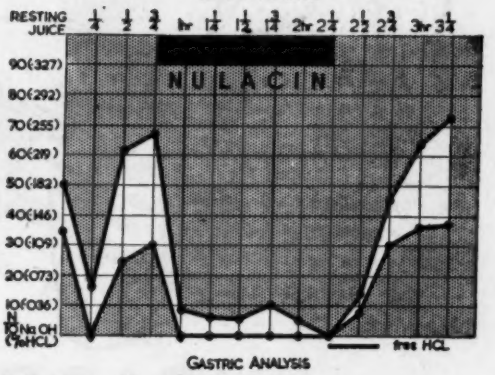

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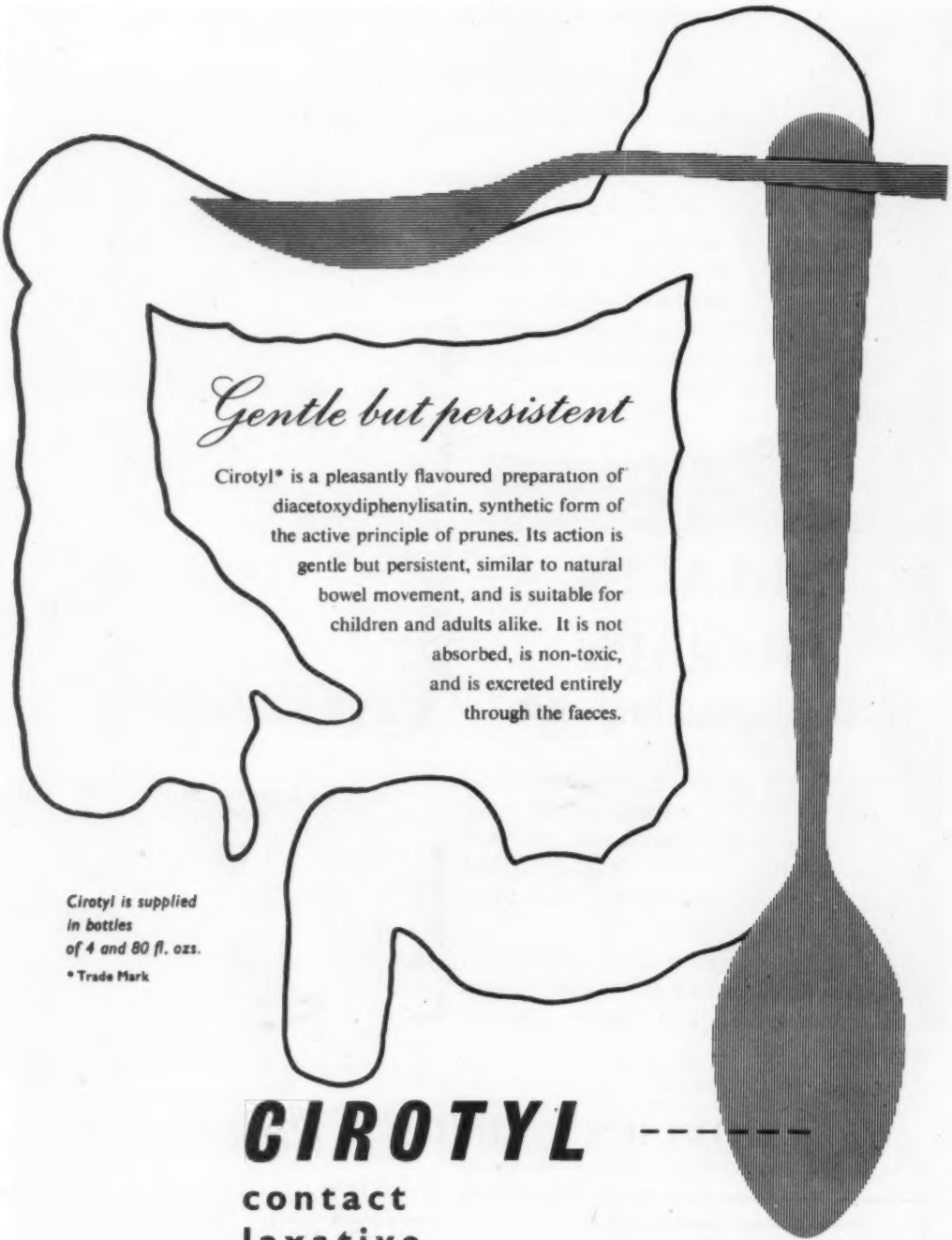

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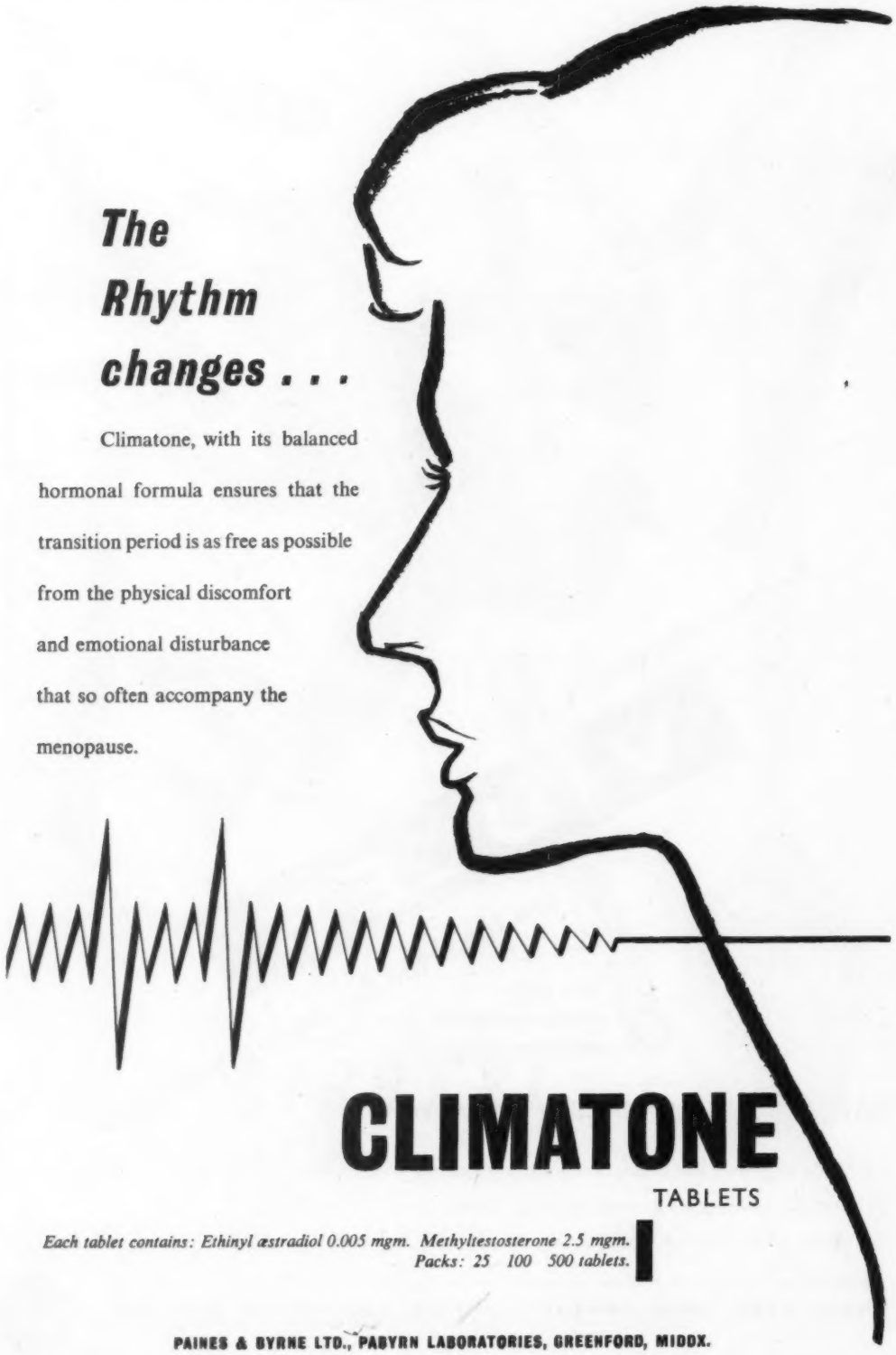

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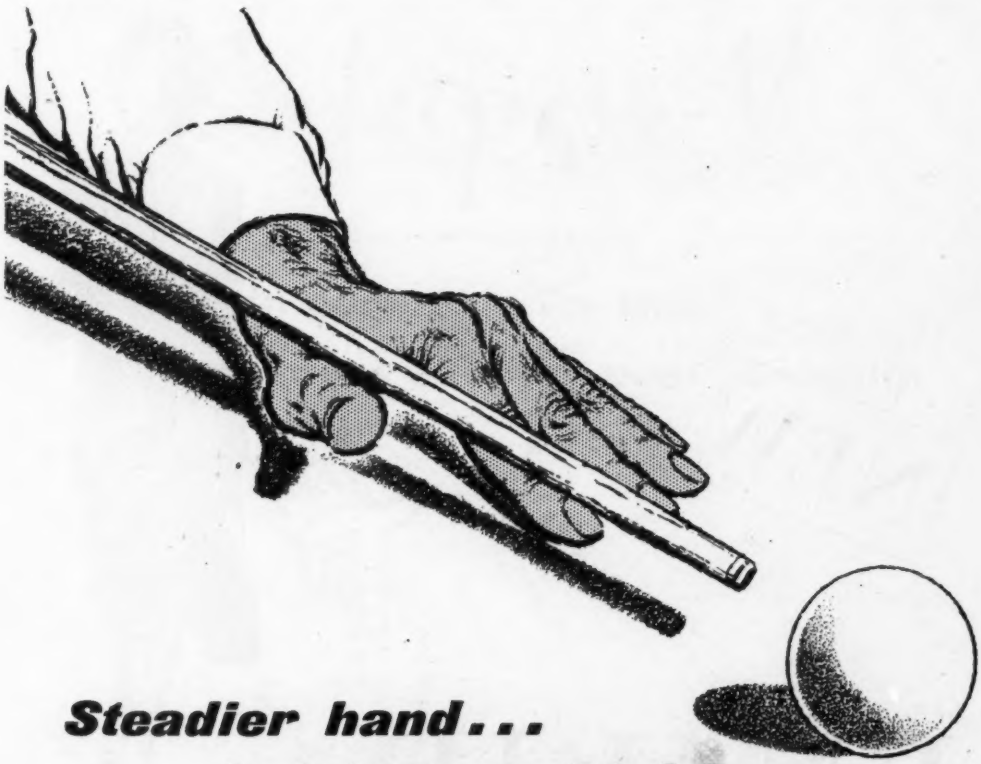

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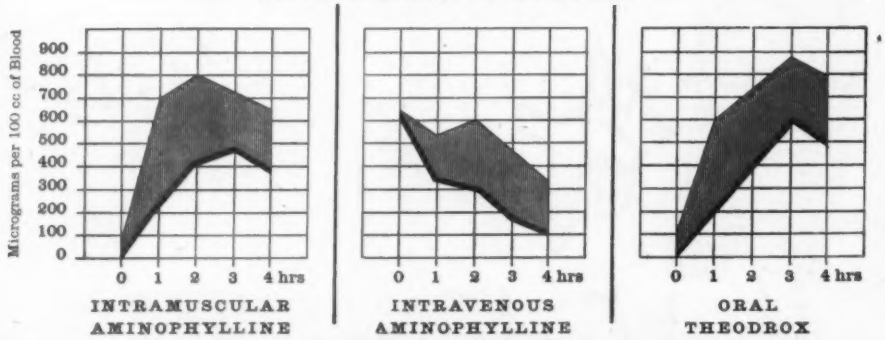

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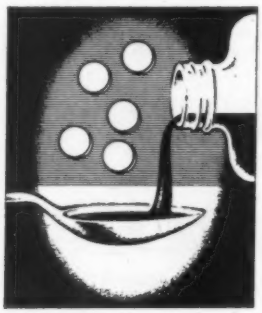

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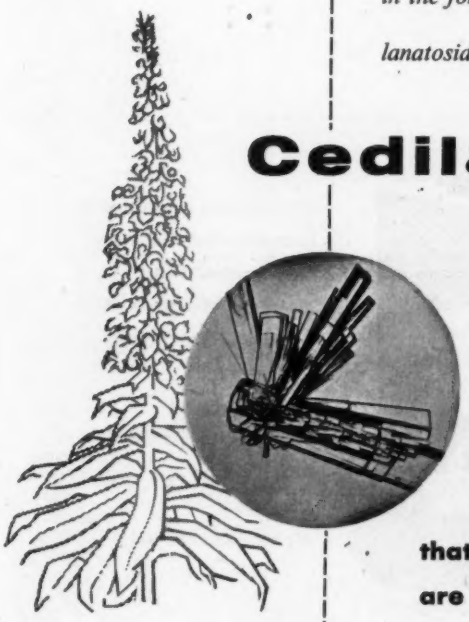

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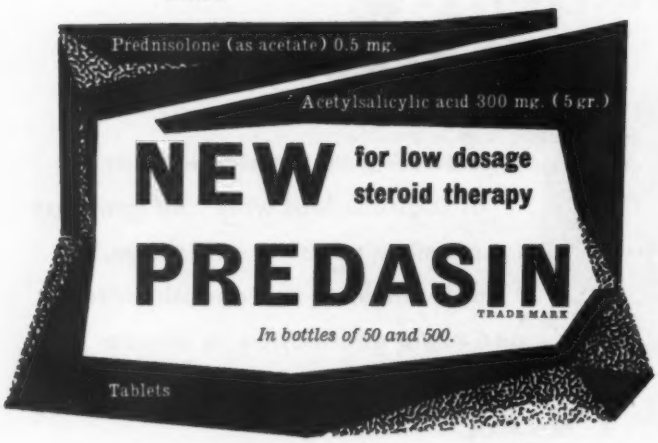

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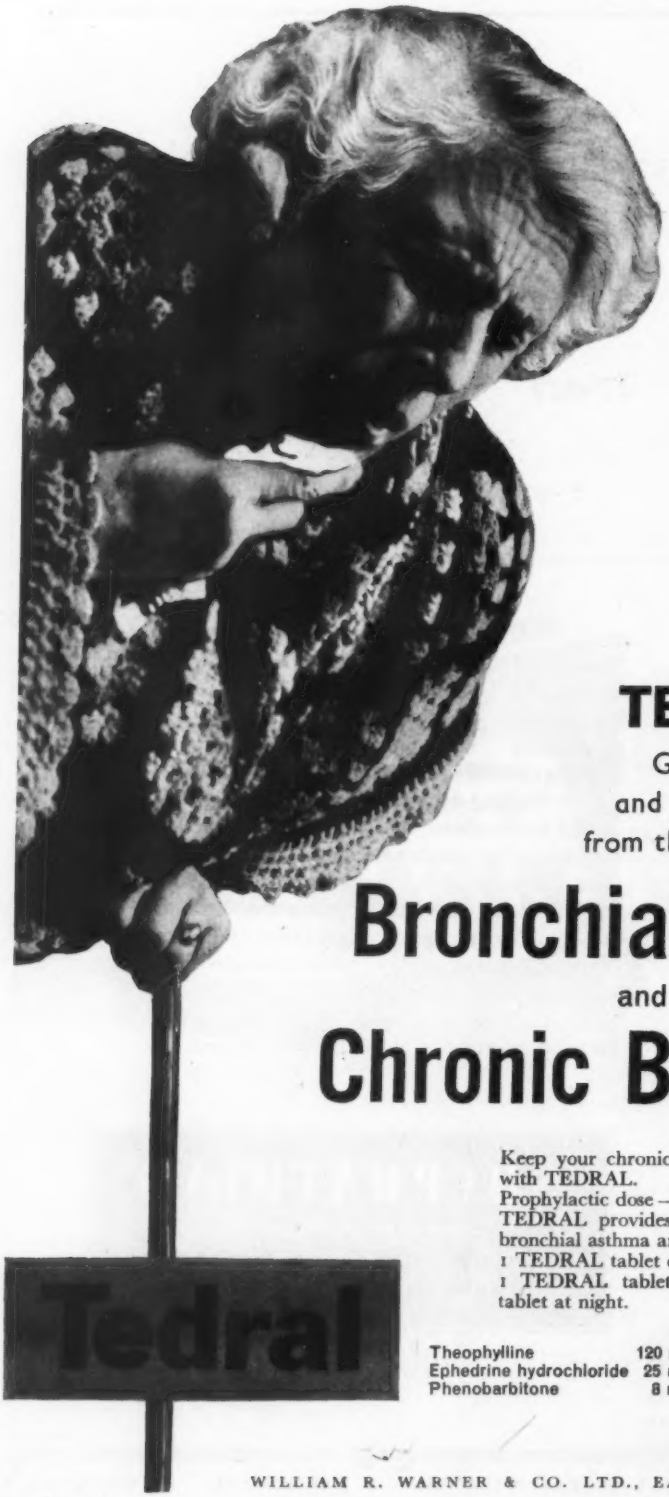

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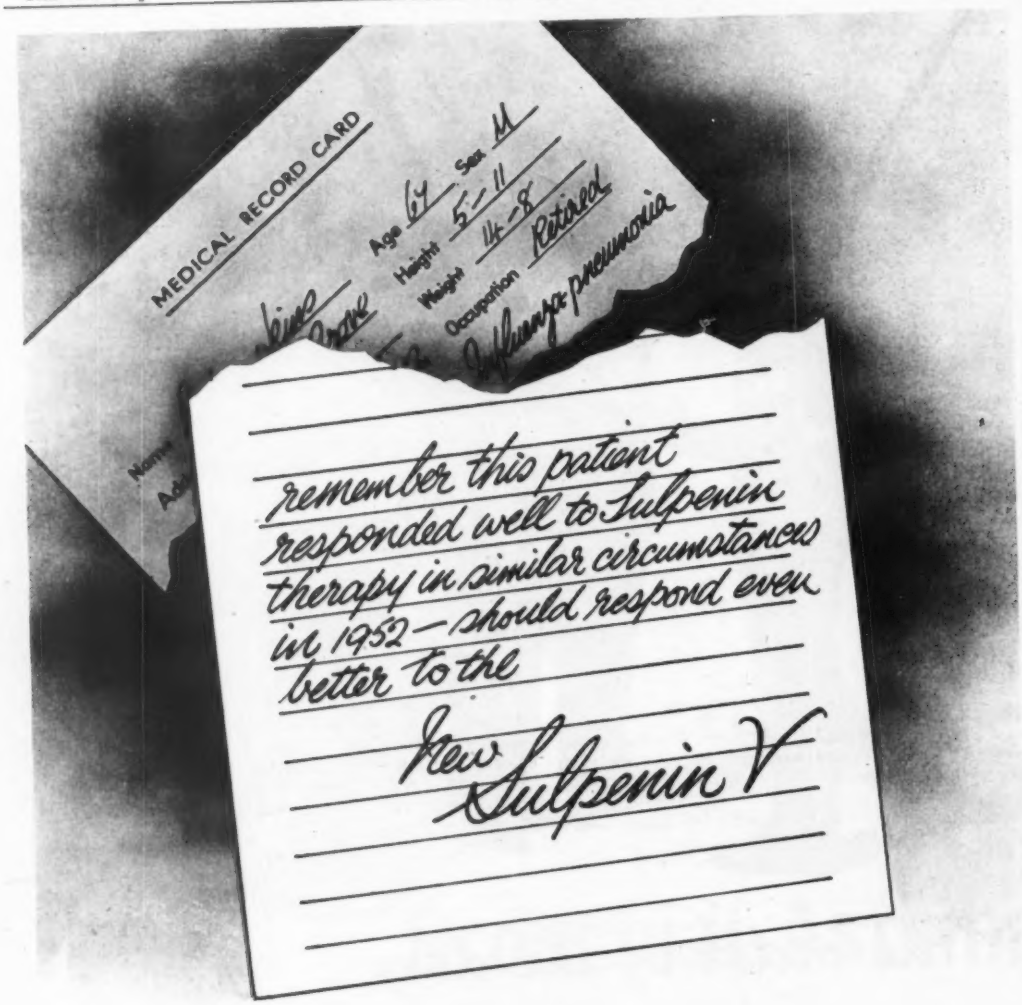
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CORONARY-ARTERY DISEASE

INFLUENCES AFFECTING ITS INCIDENCE IN MALES IN THE SEVENTH DECADE

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PRESENT knowledge of the prevalence of ischæmic heart-disease, and of its relation to influences such as social circumstances, physical activity, and diet, are derived chiefly from studies of mortality. Most observations on morbidity have been based on relatively small numbers (Sheldon 1948, Droller and Pemberton 1953, Thomas et al. 1956) or have been restricted to certain occupational or racial groups (Morris et al. 1952, Morris et al. 1953, Boas and Epstein 1954). A recent inquiry (Brown, McKeown, and Whitfield 1957a) provided an opportunity to assess the incidence of coronary-artery disease in a group of representative Birmingham men in the seventh decade, and the present report examines its relation to physical and mental demands of occupation, social class, arterial pressure, and smoking-habits.

Methods

During 1956, eleven Birmingham general practitioners attempted to interview and examine all men on their lists aged 60–69. There were 1243 men (in a total population of about 35,000), of whom 1062 (85·4%) were examined. The remainder were either untraced (58, 4·7%), dead (21, 1·7%), or not examined for other reasons, usually because the individual was not at home at the time of the general practitioner's visit (102, 8·2%). Since doctors made a serious attempt to see all patients in their own homes or in their surgeries, we are satisfied that no significant bias has been introduced.

It has been shown elsewhere (Brown, McKeown and Whitfield 1957a) that the age-distribution of the men examined is approximately the same as that of the male population of Great Britain in this decade, as indicated by the 1% sample of the 1951 census, and apart from a small deficiency in social-class IV (semi-skilled workers) the distribution by social class is reasonably consistent with that of Birmingham males aged 15 and over.

The medical examinations were of "life-assurance" type, and were supported in most cases by a miniature chest radiograph. Men who had symptoms or physical signs suggestive of coronary-artery disease were referred to one of us (A. G. W. W.) at a hospital clinic for full cardiological assessment. Among the data recorded in the history were the occupation (which is used to assess social class), the physical and mental demands of the occupation, and smoking habits. The methods used to obtain this information are described below in the appropriate sections.

Results

Prevalence of Coronary-artery Disease

The general practitioners identified 109 men with signs or symptoms suggestive of coronary-artery disease: 39 were thought to have had myocardial infarction, 57 to have angina, and 13 to have other suggestive cardiac disabilities. After full investigation, 89 of these men (8·4% of the sample of 1062) were thought to have coronary-artery disease. Where detailed cardiological assessment did not confirm the practitioner's suspicion of coronary-artery disease, symptoms were usually found to be due to chronic bronchitis and emphysema, or to heart-disease of other ætiology. The proportions of men affected in each five-year age-group (60–64 and 65–69) were 9·3% and 7·2% respectively (table I).

Of the 89 men with coronary-artery disease, 39* (44%) had had a myocardial infarction (1 man had three, 2 had two, and the remaining 36 had one). In 24 (62%) the infarcts were posterior. 25 of the 39 men were left with angina of effort.

TABLE I—PREVALENCE OF CORONARY-ARTERY DISEASE RELATED TO AGE

Age (yr.)	No. of men	No. of men with		Percent of men with coronary disease
		Myocardial infarction	Other manifestations of coronary disease	
60	115	4	7	9·6
61	140	5	9	10·0
62	130	4	6	7·7
63	108	3	5	7·4
64	111	7	6	11·7
65	103	2	5	6·8
66	96	2	3	5·2
67	79	5	3	10·1
68	91	3	3	6·6
69	89	1	6	7·9
Total	1062	36	53	8·4

Of the 50 men who had not had a myocardial infarction, 38 had angina of effort (making the total prevalence of angina 71%—63 of 89 men). Of the 38, only 5 had any electrocardiographic abnormality (1 left bundle-branch block, 1 right bundle-branch block, 1 auricular fibrillation, and 2 posterior ischæmic stigmata).

10 of the remaining 12 men had cardiac disability which was thought to be due to coronary-artery disease, but none had experienced effort angina, or had an overt episode of myocardial infarction. 7 of them had auricular fibrillation, 1 left bundle-branch block, 1 Stokes-Adams attacks, and 1 paroxysms of ventricular tachycardia. The other 2 men had episodes of coronary insufficiency.

34 (38%) of the 89 men had enlarged hearts, but in only 20 was the enlargement greater than grade I. Many of the others showed uncoiling of the aorta. 10 had auricular fibrillation and the remainder were in sinus rhythm. In 9, systolic murmurs of atheromatous type were audible and 3 had left-ventricular gallop; in the remainder the heart-sounds were normal. In 45 (51%) there was evidence of degenerative change in the radial, brachial, pedal, or retinal vessels, but in all other cases the arteries open to direct examination appeared normal for the age-group. 9 men had intermittent claudication and 4 showed evidence of cerebral vascular disease. 3 of the 89 were in frank cardiac failure and 7 others appeared to be in incipient failure. Albuminuria was found in only 2 of the group. The blood Wassermann test was negative in all cases.

3 of 89 men with coronary disease also had diabetes; the prevalence in the rest of the sample was 1·3% (13 of 973).

Of the 89 men with coronary-artery disease, 23 had retired—16 because of ill health, 3 because of an age-limit imposed by their employers, and 4 for other reasons. Fitness for full-time employment was assessed during the medical examination.

Of the 23 retired men, 14 were regarded as unfit for any form of work, 8 were employable but not fit for the work they were doing before retirement, and 1 was fit for his original occupation. Only 7 of the 16 who retired because of ill-health

* 3 of these men had their infarction after referral for cardiological investigation.

TABLE II—PERCENT OF MEN WITH CORONARY-ARTERY DISEASE ACCORDING TO PHYSICAL AND MENTAL DEMANDS OF OCCUPATION (NO. OF MEN AT RISK IN PARENTHESES)

Mental demands	Physical demands				Total
	Very heavy	Moderately heavy	Light	Sedentary	
Severe	0·0 (16)	5·8 (69)	9·1 (55)	18·8 (32)	8·7 (172)
Moderate	6·1 (82)	7·4 (175)	9·8 (174)	12·0 (83)	8·8 (514)
Trivial	6·7 (60)	6·0 (149)	8·4 (143)	13·6 (22)	7·5 (374)
Total	5·7 (158)	6·6 (393)	9·1 (372)	13·9 (137)	8·3 (1060)

were wholly or mainly disabled by coronary-artery disease; the remaining 9, though having undoubted evidence of such disease, were chiefly handicapped by other conditions (blindness 1, bronchitis and emphysema 2, parkinsonism 1, anxiety 2, nephrosis 1, cerebral thrombosis 1, intermittent claudication 1).

Of the remaining 66 men who had not retired, 4 were off work at the time of the survey—because of coronary-artery disease (2), bronchitis and emphysema (1), or cerebral vascular disease (1). 8 others had changed to less exacting work, 7 because of their coronary-artery disease and 1 because of pulmonary tuberculosis. 6 were doing their original work but for a shorter day. The remaining 48 were all in full-time employment in their original occupation, although many of them were considerably limited by coronary-artery disease and other disabilities. 2 of these men were indeed quite unfit to do any work at all, and 3 others were unfit to do their present job. Nevertheless, like many others among the 48, they continued in full-time employment, chiefly because of financial need.

Physical and Mental Demands of Occupation

Men were asked to assess the physical demands of their "original" employment as "very heavy, moderately heavy, light, or sedentary" and the mental demands as "severe, moderate, or trivial." Since these men were either a little below or above retirement age (i.e., 65) it was considered necessary to define their "original" employment as consistently as possible.

At ages 65–69, it was defined as the work done just before retirement age, and at ages 60–64 it was the work on which men were then engaged or were last engaged if they were not at work. This procedure makes no allowance for changes of employment, which are known to be particularly frequent in those age-groups in the case of men doing unskilled or heavy work. (This point is particularly relevant in the case of men with a disability which may have led to a change of employment.) But when changes have been frequent it is by no means easy to decide what should be regarded as a man's employment, and it seemed preferable to consider the work done just before retirement age. 87% of the men in the whole sample had been in the same occupation for more than five years (76% for more than ten years) and we are satisfied that in the great majority of cases the work in respect of which physical and mental demands were assessed was that on which the man had chiefly been engaged during his working life.

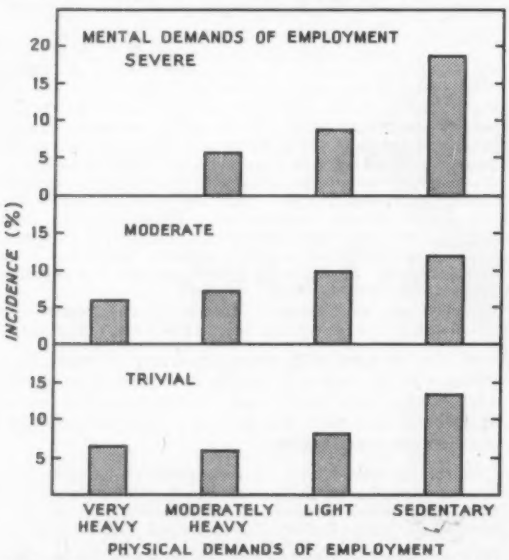

Fig. 1—Prevalence of coronary-artery disease (%) related to physical and mental demands of employment.

We also recognise the subjective nature of the information about the demands of work. Nevertheless it seems reasonable to believe that when a man is asked whether his job was very heavy, moderately heavy, light, or sedentary, or whether it imposed a severe, moderate, or trivial mental strain, his answer can be accepted. We have suggested (Brown, McKeown, and Whitfield 1957b) that the possible criticism of such criteria is not that they are inaccurate but that they are crude. If this is true it is perhaps permissible to have more confidence in positive than in negative findings.

Table II and fig. 1 show prevalence of coronary disease according to the physical and mental demands of employment. The data suggest that whatever the mental demands of occupation, in relation to physical demands there is a consistent increase in the frequency of the disease from work which is "very heavy" to work which is "sedentary." On the other hand there appears to be no consistent relationship between the mental demands of employment and the incidence of coronary disease.

TABLE III—PREVALENCE OF CORONARY-ARTERY DISEASE RELATED TO PHYSICAL DEMANDS OF OCCUPATION

Physical demands	No. of men	Percent with	
		Myocardial infarction	Other manifestations of coronary disease
Very heavy	158	3·2	2·5
Moderately heavy ..	394	2·0	4·6
Light	372	4·3	4·8
Sedentary	137	5·1	8·8

In table III the prevalence is given separately for myocardial infarction and for other manifestations of coronary-artery disease, according to the physical demands of employment. The numbers are perhaps too small to justify a firm opinion, but the data suggest that the association is present in both forms of the disease.

Social Class

Men were placed in one of five social classes (by reference to the Classification of Occupations, 1950, prepared by the General Register Office). For all types of coronary-artery disease, the incidence was not consistently related to social class (table IV), but myocardial infarction seemed to increase in prevalence from class V (unskilled occupations) to class I (professional, &c., occupations), whereas manifestations other than infarction were more common in class V than in class I. In the last case the trend is quite consistent when class I, in which numbers are rather small, is grouped with class II.

That the relative frequency of myocardial infarction and other manifestations of coronary-artery disease is not the same in all social classes is also suggested by the numbers of men affected. In classes I and II combined there were 14 with coronary occlusion and 8 with other manifestations; in classes IV and V combined the corresponding figures were 10 and 16 (table IV).

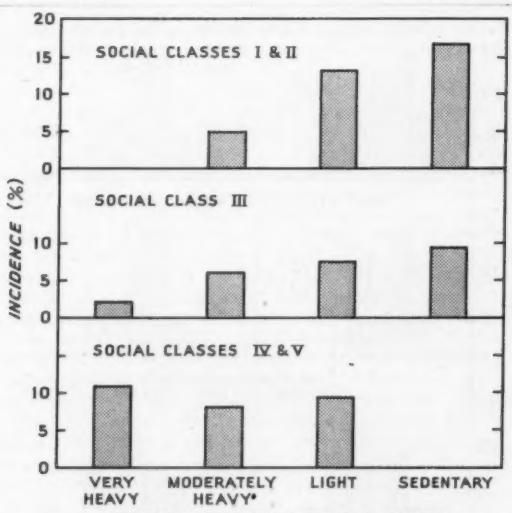

Fig. 2—Prevalence of coronary-artery disease (%) related to physical demands of employment and social class.

In table V (see also fig. 2) we have attempted to assess the relative importance of physical demands of occupation and of social class in relation to the prevalence of coronary-artery disease. Numbers in two of the corner cells of the table are very small, but in general the data are remarkably consistent. They suggest (*a*) that the association between prevalence of the disease and the physical demands of employment is more evident in classes I and II than in classes IV and V, and (*b*) that prevalence increases from classes I and II to classes IV and V in the case of men whose work makes heavy or moderately heavy physical demands.

It is perhaps surprising that in classes I and II there are occupations which make heavy physical demands. Examples are works engineer in class I and coal merchant in class II.

Arterial Pressure

Table VI gives the mean and standard deviations of systolic and diastolic pressures for (*a*) men without coronary-artery disease, (*b*) men who had survived a coronary occlusion, and (*c*) men with other manifestations of coronary disease. The distributions are shown in fig. 3. The data are entirely consistent with the clinical observation that arterial pressure is lowered after infarction. They also suggest an explanation for the conflicting views which are sometimes expressed about the level of arterial pressure in association with coronary-artery disease. Evidently an observer who examined mean pressure in patients after infarction would find it lowered; in patients with angina it would be raised; and in a mixed group it might be about the same as in the related population of the same age and sex. For the 89 men in our sample with coronary-artery disease (of all types), mean systolic and mean diastolic pressures were 163·9 and 91·9 respectively. For the 960 men not affected, the corresponding means were 161·7 and 89·9. Even on these numbers, which are much larger than in most clinical series, the differences are not significant. Yet the observations in table VI leave little doubt that arterial pressure is lowered in patients who have had an occlusion, and raised in patients who have other manifestations of coronary-artery disease.

The relation between hypertension and ischæmic heart-disease is of much interest, and the data can be used to give an estimate of the relative frequency of manifestations of coronary disease—other than occlusion—at different levels of pressure. (Since infarction leads to reduction of pressure, it is evidently necessary, before assessing this frequency, to exclude patients who had had an infarction.) The prevalence in a stated range of arterial pressure is given approximately by the ratio of the number of affected to the number of unaffected persons.

The prevalence of manifestations of coronary-artery disease other than myocardial infarction was approximately doubled for an increase of 15 mm. Hg diastolic, and 30 mm. Hg systolic pressure (fig. 4; the straight lines have been drawn to correspond exactly with a doubling of pressure for these increments).

Smoking Habits

The method of recording amounts smoked was that used in other inquiries (Doll and Hill 1950). A man was regarded as a smoker if he had smoked 1 cigarette daily (or ½ oz. of tobacco weekly) for a year. Smokers were asked at what age they started, how much they were smoking at present, or (if they had given up smoking) the age at which they stopped, and the amount smoked immediately before. The data (table VII) do not show any appreciable difference between smokers and non-smokers in the prevalence of coronary-artery disease.

TABLE IV—PREVALENCE OF CORONARY-ARTERY DISEASE RELATED TO SOCIAL CLASS

Social class	No. of men	Percent of men with			No. of men with	
		Myocardial infarction	Other manifestations of coronary disease	Coronary disease (all types)	Myocardial infarction	Other manifestations of coronary disease
I	28	10·7	0·0	10·7	14	8
II	159	6·9	5·0	11·9		
III	614	2·0	4·7	6·7		
IV	108	4·6	5·6	10·2	12	29
V	153	3·3	6·5	9·8	10	16

TABLE V—PERCENT OF MEN WITH CORONARY-ARTERY DISEASE ACCORDING TO PHYSICAL DEMANDS OF OCCUPATION AND SOCIAL CLASS (NO. OF MEN AT RISK IN PARENTHESES)

Social class	Physical demands				Total
	Very heavy *	Moderately heavy	Light	Sedentary	
I and II	0·0 (8)	4·8 (42)	13·0 (77)	16·7 (60)	11·8 (187)
III	2·3 (86)	6·1 (244)	7·6 (211)	9·6 (73)	6·5 (614)
IV and V	10·9 (64)	8·3 (108)	9·5 (84)	50·0 (4)	10·0 (260)
Total	5·7 (158)	6·6 (394)	9·1 (372)	13·9 (137)	8·3 (1061)

Discussion

The prevalence of coronary-artery disease which we have found in 1062 men aged 60–69 (8·4%) is somewhat lower than that reported in some other series (Boas and Epstein 1954) and very much lower than the estimate

TABLE VI—ARTERIAL PRESSURE IN MEN WITH AND WITHOUT CORONARY-ARTERY DISEASE

—	No. of men	Systolic pressure		Diastolic pressure	
		Mean	Standard deviation	Mean	Standard deviation
Men without coronary disease	960	161·7	28·6	89·9	14·1
Men with myocardial infarction	36	152·1	24·0	86·2	13·7
Men with other manifestations of coronary disease	53	172·6	30·3	96·2	17·9

of 38% obtained by Thomas et al. (1956) in 47 coalminers aged 55–64. In Thomas et al.'s inquiry, however, it was held that about half the cases could not have been identified without full cardiological investigation, and to obtain a comparable figure we should have had to assess fully all of the 1062 men in our sample. Our estimate is therefore to be interpreted as the prevalence of coronary-artery disease associated with signs or symptoms in a representative group of men in the seventh decade. The prevalence was not higher in the second five years of the decade (7·2%) than in the first (9·3%). The apparent absence of an increase in morbidity with age is perhaps attributable to removal of susceptible individuals by death.

Our examination of the relationship of the prevalence of coronary-artery disease to physical and mental stress was based on the man's own statement about the demands of his employment, and there are grounds for reserve in accepting this evidence as a reliable index of the strength of these influences. In the first place occupation is only one of the sources of stress, though it is a major one. Secondly, the judgment is open to the criticism that it is subjective—though it seems reasonable to regard a man's opinion about the physical and mental demands which his occupation makes upon him as being at least as valid as that of any other observer.

TABLE VII—INCIDENCE OF CORONARY-ARTERY DISEASE RELATED TO SMOKING HABITS

Type of disease	Percent of men affected among					No. of men affected
	Non-smokers	Pipe-smokers	Pipe and cigarette smokers	Cigarette-smokers who have given up smoking	Cigarette-smokers	
Myocardial infarction	3·3	5·1	3·7	2·5	3·1	36
Other manifestations of coronary disease	6·6	3·3	4·9	4·3	5·4	53
Coronary disease (all types)	9·9	8·4	8·6	6·8	8·5	88
Number of men ..	91	178	81	162	542	

There are evidently two ways in which we can look at the demands of employment. One can say that a job is heavy, or that it is heavy for a small man. The first method considers only the requirements of the work; the second attempts to assess them in relation to the resources of the individual. It is the second method which we have attempted to use, and in respect of which it is suggested that a man's own assessment is not likely to be less reliable than anyone else's.

There is a further difficulty, in that the two variables (physical and mental demands of employment) are negatively correlated. In spite of these reservations, however cautiously interpreted, the data seem to us to indicate that low physical demands of occupation are a much more potent influence on the incidence of coronary-artery disease than severe mental demands. And taken with evidence from quite different sources (Stocks 1951, Morris et al. 1953) they suggest a relationship between physical activity and ischæmic heart-disease. They do not, of course, exclude the possibility that the apparent association merely reflects a common relationship to some other more important agent. But if so it seems very unlikely that this agent is the mental stress of work, as suggested by Ryle and Russell (1949).

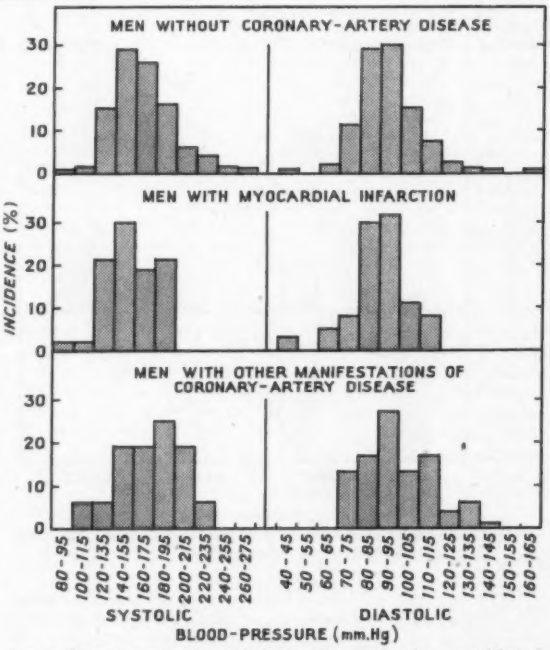

Fig. 3—Percentage distribution of arterial pressures in men with and without coronary-artery disease.

It also seems improbable that the association between prevalence and physical demands of employment results from association between each variable and social class (using the term in the traditional sense). Morris et al. (1953) showed that within the same social class the mortality from coronary-artery disease was lower in heavy than in light workers, and the same conclusion is suggested by the evidence of table v and fig. 2.

Indeed, the effect of social class on morbidity is much less conspicuous than its effect on mortality, and when all forms of the disease are considered together there is little evidence of a trend (table iv). Nevertheless the data do suggest that there are social differences in experience of the disease, angina being relatively more common among unskilled labourers (class v) and myocardial infarction more common among professional and related groups (classes i and ii). This result is not inconsistent with the well-established observation that

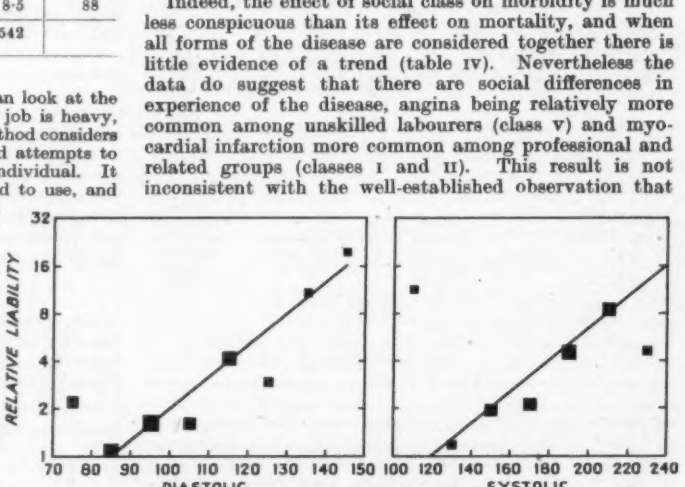

Fig. 4—Relative liability to manifestations of coronary-artery disease, other than myocardial infarction, according to arterial pressure (the area of each square is determined by the number of observations *).

* More exactly, when there are p affected and q unaffected, the position of the point is determined by the value of $\log_2 \frac{p + \frac{1}{2}}{q + \frac{1}{2}}$ and its size by $\frac{1}{\frac{1}{p+1} + \frac{1}{q+1}}$ (Haldane 1956).

mortality is higher in class I than in class V, the social-class variation being more evident in the form the disease takes than in its prevalence.

In examining the prevalence of coronary-artery disease according to arterial pressure, we prepared an estimate of relative risk of manifestations other than occlusion at different levels of pressure. Their prevalence was approximately doubled for an increase of 15 mm. Hg diastolic or 30 mm. Hg systolic pressure. It is scarcely necessary to add that we do not imply that the raised prevalence is attributable directly to the raised pressure, since of course both might result from some other common influence.

Finally, we should perhaps avoid possible misunderstanding of the evidence related to tobacco by emphasising that we have shown only that the proportion of men alive in the seventh decade who have coronary-artery disease appeared to be unrelated to their smoking habits. Heavy smokers might be selectively eliminated before reaching the age of 60; thus this observation is not inconsistent with the possibility that smoking increases mortality from the disease, as suggested by the work of Hammond and Horn (1954) and Doll and Hill (1956).

Summary

Eleven Birmingham general practitioners interviewed and examined 1062 (85·4%) of the 1243 men on their lists who were aged 60–69. Those with symptoms or physical signs suggestive of coronary-artery disease were referred for full cardiological investigation, and the diagnosis was confirmed in 89 (8·4%). The prevalence seemed to be unrelated to the mental demands of the men's occupation or to their smoking habits: it was fairly closely related to the physical demands of occupation, being highest for men in sedentary work. The association between prevalence and physical demands of work was most evident among men in professional and related occupations (social classes I and II).

When all types of disease were considered together, prevalence was not consistently related to social circumstances, but myocardial infarction seemed to increase in prevalence from men in unskilled occupations (class V) to those in professional occupations (class I), whereas manifestations other than infarction were more common in class V than in class I.

Arterial pressure was raised in patients with coronary-artery disease who had not had an infarction, and lowered in those who had. The observations suggest that the prevalence of manifestations of coronary disease—other than infarction—was approximately doubled for an increase of 15 mm. Hg diastolic, or 30 mm. Hg systolic pressure.

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ACUTE LOWER-RESPIRATORY INFECTIONS IN CHILDHOOD

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THE 191 cases of acute respiratory illness which form the subject of this investigation represent consecutive admissions to the children's beds of St. Mary's Hospital and of Paddington Green Children's Hospital in three winters (1953–54, 1954–55, and 1955–56), plus a few cases admitted during the summer months and a few treated at home by the home-care service of St. Mary's Hospital.

Practically all cases of acute respiratory illness affecting any part of the tract from the larynx downwards were included. There was no deliberate selection, but these were cases which were considered severe enough to be admitted to hospital and therefore do not represent a cross-section of all the acute respiratory illnesses in childhood.

Other factors affecting admission were the number of empty beds available at any particular time, bad home conditions, and, in the home-care cases, the actual clinical picture. In spite of the relative shortage of cubicle accommodation (used for all children under the age of 1 year) about a third of all the admissions were infants.

The object of the study was to try to obtain a comprehensive picture of the type of case usually admitted to hospital. It was planned prospectively, special notes being kept of all the cases. Besides clinical and radiographic examinations, bacteriological data were obtained in three-quarters of the cases, hæmatological data in 90%, and virus-serological data in nearly 50% of cases. Failure to obtain satisfactory swabs before chemotherapy (either because the child had been treated outside, or because the material was not taken immediately on admission) explains the deficiency in bacteriological data. The availability of serological data depended largely on the ease with which samples of blood were obtained. Relatively fewer specimens were obtained from the younger children, particularly from the seriously ill and anoxic babies whom it was not thought justifiable to disturb in the acute stages. However, as will be seen from table VI, the results are all stated as a proportion of cases tested, and there was no particular selection as regards clinical type.

Methods

Clinical Classification

For comparing various factors the cases were classed into four clinical groups according to the predominant

picture on admission, although a large proportion of the cases had evidence of diffuse respiratory-tract involvement—e.g., about half the cases of acute obstructive bronchiolitis also had clinical and/or radiographic evidence of early bronchopneumonia, but they are classified as acute bronchiolitis.

Group A, segmental pneumonia (46 cases), essentially similar to lobar pneumonia in the adult, consolidation being confined usually to one segment of one lobe, and having physical signs and X-ray picture of a homogeneous and well-demarcated lesion.

Group B, bronchopneumonia (55 cases), comprising diffuse bilateral patchy consolidation as well as more localised, but still patchy, change which may be confined to one part of one lung.

Group C, bronchiolitis (51 cases), comprising all cases with a diffuse bilateral capillary bronchitis, associated in younger children with variable degrees of bronchial obstruction.

Group D, simple bronchitis, tracheobronchitis, and laryngotracheitis (39 cases).

Physical signs and X-ray picture were used together in classification.

In addition the cases were classified clinically as regards severity of the illness, after consultation between two members of the team, into four groups: mildly ill, moderately ill, seriously ill, and vulnerably ill, the last category comprising only those children who, it was thought, might possibly die.

Hæmatological Examination

Total and differential white-cell counts were done on nearly all the children within twenty-four hours of admission. Hæmoglobin estimations were done in nearly 70%, and erythrocyte-sedimentation rates (Westergren method modified for capillary blood by using a 100-mm. column and tubes with 1·5-mm. bore) in nearly 40% of the children.

Bacteriological Methods

Throughout the survey a "cough" swab was taken from each patient shortly after admission and before the start of chemotherapy. It consisted of serum-coated cotton-wool attached to the end of a bent wire, as described by Rubbo and Benjamin (1951), who showed that the serum coating prolonged the survival of most bacterial pathogens. It was taken from the supralaryngeal region after an attempt to induce cough by the stimulus of a tongue-depresser; in this way a blob of sputum was often collected. For the first two seasons pernasal and throat swabs were also collected.

Table I compares the cultural results for 71 patients from whom all three swabs were taken on admission. The differences found show the importance of choice of swab. The cough swab samples the lower respiratory flora better than do the two other swabs; so its results were used for comparison with the clinical and laboratory findings of the investigation.

Respiratory pathogens are often found in the upper-respiratory tracts of children, and their presence does not necessarily indicate infection. In this survey the pernasal and throat swabs showed differences in the isolation-rates of the various respiratory pathogens similar to those found in studies of healthy children; in particular the higher incidence of pneumococci and *Staphylococcus pyogenes* in the pernasal swabs and of group-A streptococci in the throat swabs was noted.

TABLE I—COMPARISON OF CULTURAL RESULTS OF COUGH, PERNASAL, AND THROAT SWABS TAKEN FROM 71 PATIENTS ON ADMISSION

Organism	No. of positive swabs			No. of children with positive swabs
	Cough	Pernasal	Throat	
Staph. pyogenes	10	7	4	17(22%)
Pneumococci	18	28	12	37(52%)
Hæmophili	10	8	8	15(21%)
Group-A streptococci ..	6	1	7	11(15%)
Coliform bacilli	6	0	4	7(10%)

The respiratory pathogens grown from the cough swab may also not be infecting although, being derived from a site which is normally sterile, they are more likely to be contributing to the respiratory infection. More cough swabs than pernasal or throat swabs were positive for *Staph. pyogenes*.

The swabs were plated on blood-agar, blood-agar with crystal-violet and streptomycin for pneumococci and hæmolytic streptococci (Masters et al. 1957), and Fildes' extract-agar with crystal-violet for *Hæmophilus influenzæ*. The growth was expressed as heavy (+++), moderate (++), or light (+) for each kind of organism present on culture.

The following organisms were considered to be potential pathogens and were looked for particularly: coagulase-positive *Staph. pyogenes*, pneumococci, *H. influenzæ*, group-A hæmolytic streptococci, and coliform bacilli.

Serological Methods

Either venous or capillary arterial blood was collected during the first few days of the illness and again during convalescence, and the serum was tested for antibodies to influenza viruses A, B, and C, the adenoviruses, and, in the later stages, the Sendai virus.

Acute and convalescent sera were examined by the complement-fixation test (C.F.T.), a modified version of the technique of Fulton and Dumbell (1949) being used. The test was made on 'Perspex' plates, and all solutions and dilutions were made up in a barbiturate buffer (Mayer et al. 1946).

A 1/4 dilution of the convalescent serum was screen-tested, and doubling dilutions of positive sera were titred out between 1/2 and 1/256 against known positive antigens.

The incubation period for the C.F.T. with the adenoviruses was 75 minutes and that for influenza A, B, and C 90 minutes at 37°C. After the addition of the sensitised R.B.C. suspension and subsequent incubation for $^1/_2$ hr. at 37°C the test was left overnight at 4°C and read next morning.

Fourfold rises in titre between the acute and convalescent sera, and convalescent titres of 1/32 for influenza and 1/16 for adenoviruses, were considered to be evidence of recent infection.

Tissue Culture

In some of the later cases separate swabs were taken and cultured for the adenoviruses.

HeLa cells were used throughout. Stock cultures were grown in 8-oz. 'Pyrex' feeding-bottles in 80% synthetic medium and 20% human serum. Individual tubes containing 1 ml. of the cell suspension (100,000 cells per ml.) in a final medium of 90% synthetic medium 199 and 10% normal rabbit serum were incubated at 37°C stationary overnight. Next day the tubes were inoculated and placed in a roller drum.

Specimens for virus examination consisted of nasal, conjunctival, pharyngeal, and supralaryngeal swabs. The material was collected on plain or serum-coated cotton-wool swabs and transferred to 1 ml. of 1% broth in saline solution and kept frozen. The isolation material was inoculated into three tubes of the HeLa-cell cultures in a final dilution of 10^{-1}. Fluids were changed every 4–6 days, and the tubes observed at intervals for 28 days. A specimen was considered positive only if typical cytopathogenic changes could be passed to successive cultures, and confirmed by positive C.F.T.

Chemotherapy

The antibiotics used included penicillin, chlortetracycline (aureomycin), oxytetracycline, streptomycin, and erythromycin. Sulphonamides were also used. The choice was left to the physician in charge of the case.

In the first two winters penicillin and streptomycin together were used in any case of severe illness, and either penicillin or oxytetracycline alone for the less severe ones; in the third winter the children were given either sulphadimidine or tetracycline, with the addition of penicillin in severe cases, and erythromycin was throughout kept for patients from whom a penicillin-resistant staphylococcus was isolated.

Whenever the bacteria grown were insensitive to the drug used, a change was made as indicated. The criteria of a specific response to chemotherapy were a well-marked abatement of pyrexia and improvement in the general condition of the child within 24 hours.

Analysis of Data

Data were recorded on punch cards under more than forty headings, and extensive comparisons were made

TABLE II—RELATIONSHIP OF DIAGNOSTIC CATEGORY AND AGE

Disease	No. of children			
	Aged<1 yr.	Aged 1–4 yr.	Aged>5 yr.	Total
Segmental pneumonia	7(11%)	22(24%)	17(49%)	46
Bronchopneumonia ..	17(26%)	36(39%)	2(6%)	55
Bronchiolitis	27(42%)	15(16%)	9(26%)	51
Bronchitis tracheobronchitis, or laryngotracheitis ..	14(21%)	18(20%)	7(20%)	39
Total	65	91	35	191

$\chi^2 = 35{\cdot}58$ n = 6 P<0·01

The four clinical conditions do not occur with equal frequency in all the age-groups. There is an excess of bronchiolitis in infants aged less than 1 year, and of segmental pneumonia in those aged more than 5 years, which fact is highly significant statistically.

in an attempt to find relevant positive correlations, which were then examined statistically. The positive findings will be presented and discussed, while negative findings will be considered only where they seem to call for some comment.

Results

Clinical Picture

A highly significant correlation between the age of the child and the predominant clinical picture was found :

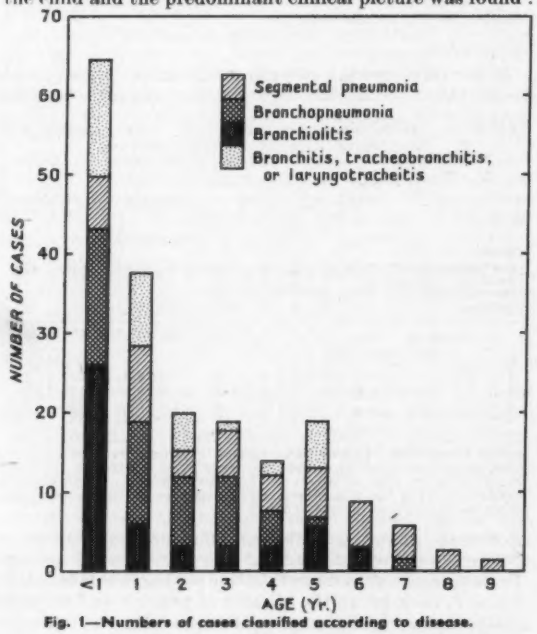

Fig. 1—Numbers of cases classified according to disease.

there was an excess of bronchiolitis cases in the infants (aged 0–1 year), of bronchopneumonia among the toddlers (aged 1–4 years), and of segmental pneumonia among the older children (aged 5 years or more) (figs. 1 and 2 and table II). Accordingly all other data were compared with these two factors in an attempt to determine whether there were any further strongly positive or negative correlations.

Bronchiolitis

Table III shows the relationship between clinical category, age-group, and recovery of a recognised bacterial pathogen from the supralaryngeal swab.

The isolation-rate of the pathogen depends to some extent on the age of the child regardless of clinical condition, being higher in the infants and older children than in the toddlers ; it seems likely that this could be connected with the difficulties of obtaining satisfactory swabs in the toddlers.

Superficially it appears from table III that there must be at least an important bacterial element in infantile bronchiolitis, because in most cases a potential pathogen grew. However, table IV shows that infants aged less than 1 year with bronchiolitis showed a specific response to antimicrobial therapy in only 31% of cases, in contrast to the 86% response in babies with segmental pneumonia and 59% in bronchopneumonia. This latter finding fits in with the opinion often expressed that bronchiolitis is essentially a virus disease.

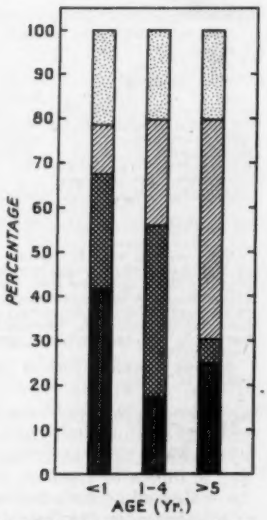

Fig. 2—Percentages of cases classified according to disease.

Clinical evidence, which showed conclusively in this series that the danger to life lay essentially in the anoxia due to mechanical obstruction (Morrison 1955), suggests an additional explanation for this apparent contradiction : although specific response to antimicrobial therapy was infrequent, a partial improvement was often observed and took the form of abatement of pyrexia and disappearance of what is perhaps the most reliable evidence of pneumonia at this age—grunting and inverted respiratory pattern.

It seems likely that a non-bacterial and diffuse inflammation of the whole bronchial tree, which is responsible for the obstruction in the small bronchioles, is often complicated by a secondary bacterial infection causing pneumonia, and 50% showed evidence of bronchopneumonia. The bacterial infection responds to antimicrobial therapy, but the predominant virus infection runs its course, and symptomatic treatment of the anoxia is the important therapeutic measure.

Table V shows that the proportion of infants aged less than 1 year with bronchiolitis having polymorph counts greater than 5000 per c.mm. is considerably less than that of infants of the same age suffering predominantly from segmental pneumonia or bronchopneumonia.

In view of such clinical and laboratory evidence suggesting that virus infection is the basis of bronchiolitis in babies, it is interesting to note the very low percentage of positive serological results to known viruses in this

TABLE III—RELATIONSHIP OF CLINICAL CONDITION AND AGE TO PRESENCE OF RECOGNISED BACTERIAL PATHOGENS * IN SUPRALARYNGEAL SWAB

	Proportion of children with pathogens *				Pathogen rate (% of given condition)
	Aged >1 yr.	Aged 1–4 yr.	Aged >5 yr.	Total	
Disease :					
Segmental pneumonia	5/5	11/15	10/14	26/34	77
Bronchopneumonia ..	8/11	14/28	1/1	23/40	58
Bronchiolitis	16/17	7/13	5/7	28/37	76
Bronchitis tracheobronchitis, or laryngotracheitis	5/10	8/16	4/4	17/30	57
Total	34/43	40/72	20/26	94/141	
Pathogen-rate (% of given age-group) ..	79	56	77	67	

* *Staph. aureus*, hæmolytic streptococcus, pneumococcus, *H. influenzæ*, and *Esch. coli*.

The pathogen isolation-rate depends to some extent on the age of the child regardless of clinical condition.

TABLE IV—RELATIONSHIP BETWEEN DIAGNOSTIC CATEGORY, AGE, AND SPECIFIC RESPONSE TO ANTIMICROBIAL DRUGS

Disease	No. of children with specific response		
	Aged<1 yr.	Aged>1 yr.	Total
Segmental pneumonia ..	6/7(86%)	23/35(66%)	29/42(69%)
Bronchopneumonia ..	10/17(59%)	20/37(54%)	30/54(56%)
Bronchiolitis	8/26(31%)	12/24(50%)	20/50(40%)
Bronchitis, tracheobronchitis or laryngotracheitis	4/13(32%)	10/21(48%)	14/34(41%)
Total	28/63(44%)	65/117(56%)	93/180(52%)

The response-rate to antibiotic therapy over the whole group of children is slightly greater for children aged more than 1 year than for those aged less than 1 year.

In relation to clinical category there is a definite trend in response-rates, suggesting that segmental pneumonia is more likely to respond than are bronchiolitis, bronchitis, tracheobronchitis, and laryngotracheitis. In the children aged less than 1 year this trend is accentuated.

Specific response denotes well-marked clinical improvement within 24 hours.

age-group (table VI). One classical case of obstructive bronchiolitis in a baby aged 6 months was accompanied by a rise in titre to influenza B from nil on the fourth day of illness to 1/160 on the eighteenth day, but similar cases showed no such finding.

Whatever the ætiological agent may be in this condition it is not predominantly one of the common identifiable viruses; the relationship to the common cold is at present only a matter for conjecture, but coryza figured prominently in the initial symptoms of 14 of 27 cases.

Segmental Pneumonia

The preponderance of segmental pneumonia in children aged more than 5 years (17 of 35 cases, table II) calls for comment. Although the isolation of potential pathogens from the supralaryngeal swab was 77%, with a specific response to chemotherapy in 66% and high polymorph counts in more than 70%, suggesting a bacterial infection, there was also evidence of virus infection in this group. Thus in 6 of the 17 cases there was a minor respiratory illness succeeded after 4 or 5 days by acute illness and high pyrexia; in 7 the onset was insidious and the diagnosis made only after 2–3 weeks; and in only 4 was there an acute pyrexial onset. Positive serological findings were obtained in 4 of 12 cases tested. In 8 of 15 radiological reports partial collapse was mentioned as well as consolidation.

These various findings suggest that, in this age-group, a primary virus infection often produces a mild illness which is succeeded by secondary bacterial pneumonia, possibly following partial bronchial obstruction.

Bronchopneumonia

The bronchopneumonia which is the commonest clinical picture in the toddlers aged 1–5 years is associated with a lower isolation rate of pathogens from the swabs, but this could well be due to some technical factor in view of the difficulty of obtaining a satisfactory swab from children of this age. The number of children in this

TABLE V—RELATIONSHIP OF POLYMORPH COUNT TO CLINICAL CATEGORY AND AGE-GROUP

Disease	No. of children with polymorphs more than 5000 per c.mm.		
	Aged<1 yr.	Aged>1 yr.	Total
Segmental pneumonia ..	3/7(43%)	27/38(71%)	30/45(67%)
Bronchopneumonia ..	8/16(50%)	18/34(53%)	26/50(52%)
Bronchiolitis	5/21(24%)	9/19(47%)	14/40(35%)
Bronchitis, tracheobronchitis, or laryngotracheitis	4/13(31%)	13/24(54%)	17/37(46%)
Total	20/57(35%)	67/115(58%)	87/172(51%)

There were more children aged more than 1 year with polymorph counts of more than 5000 per c.mm.

In the group considered as a whole and considered separately for age the evidence suggests that the leucocytosis-rate was less for bronchiolitis than for the other three clinical conditions, especially in children aged less than 1 year.

group showing a specific response to chemotherapy and a polymorph count more than 5000 per c.mm. (tables IV and V) is intermediate between the bronchiolitis and segmental pneumonia groups, as is also the proportion showing a positive serological result. These children were on the average admitted to hospital 2–3 days later than the babies with bronchiolitis; it appears reasonable to postulate that they also often start with a virus infection of the tract which, though fairly widespread, does not cause serious illness from mechanical obstruction at this age, and only when secondary bacterial infection is advanced enough to produce a definite bronchopneumonia do they become ill enough to be sent to hospital.

Miscellaneous Group

The laryngitis-tracheitis-bronchitis group is made up of all the less severe cases; it comprises 25 cases of simple bronchitis (6 in asthmatic children with an acute infection), 6 of bronchitis with laryngitis or tracheitis, and 8 with a predominantly laryngeal picture. These cases were more evenly distributed in the different age-groups in contrast to the three other clinical categories. The type of pathogen isolated was very much the same as in the whole series, but there was a low incidence of raised polymorph counts and positive serological findings (tables II, III, V, and VI).

Bacteriology

Table VII shows the cultural results of the initial cough swabs taken during the three years of the investigation.

TABLE VI—SEROLOGICAL RESULTS IN 92 CASES TESTED FOR INFLUENZA A, B, C, AND ADENOVIRUS

—	No. of positives				Total	Negative	Total tested
	Influenza A	Influenza B	Influenza C	Adenovirus			
Disease:							
Segmental pneumonia	1	2	2	5	9(36%)	16	25
Bronchopneumonia ..	1	2	2	1	5(23%)	17	22
Bronchiolitis ..	0	1	4	4	8(32%)	17	25
Others	1	0	1	1	3(15%)	17	20
Total	3	5	9	11	25(27%)	67	92
Age (yr.):							
1	0	2	0	0	2(9%)	19	21
1–2	0	1	1	2	4(25%)	12	16
2–5	1	1	5	4	10(31%)	22	32
5 + ...	2	1	3	5	9(39%)	14	23

The breakdown of these figures gives total numbers too small for true assessment. So far as they go, there is no significant difference in positives in any of the four clinical conditions. (The total of positive cases is less than the total of positive results because some cases were positive for two viruses.)

For each potential pathogen it gives the number of positive cultures in each of the four clinical groups. From several swabs more than one pathogen was isolated; hence in each group the number of positive and negative cultures exceeds the number of swabs. No one pathogen predominates in any of the clinical groups, but a relationship between any of the respiratory pathogens and a particular clinical group is liable to be obscured because some of the pathogens grown may not be associated with the infection, and several swabs grew more than one pathogen.

In the group of segmental pneumonia about three-quarters of the swabs grew pathogens; pneumococci, *Staphylococcus aureus*, group-A streptococci, and hæmophili were about equally represented, and only coliform bacilli were uncommon. Although more than one pathogen was grown from eight swabs, there were instances in which *Staph. pyogenes*, group-A streptococci, and hæmophili, as well as pneumococci, were each the only pathogen grown. In classical lobar pneumonia specific types of pneumococci—e.g., types 1, 2, 5, and 7—were reported as being by far the commonest pathogen. Pneumococcus typing was not done, but it is noteworthy that in this group, in which only a segment of a lobe was usually affected and collapse was often present as well, other

TABLE VII—PATHOGENS ISOLATED FROM COUGH SWABS CORRELATED WITH CLINICAL GROUPS

Disease	Potential pathogens					No pathogens	No. of swabs
	Staph. aureus	Group-A streptococci	Pneumo-cocci	*H. influenzæ*	*Esch. coli*		
Segmental pneumonia	9	6	6	9	3	8	34
Bronchopneumonia	6	4	12	7	3	19	44
Bronchiolitis	6	2	6	10	6	11	35
Others	1	3	4	8	2	12	27
Total	22(16%)	15(11%)	28(20%)	34(24%)	14(10%)	50(36%)	140

Since more than one pathogen was isolated from several swabs, the number of positive and negative swabs in each group exceeds the total number of swabs.

pathogens were found as frequently as pneumococci (table VII). Even in children aged more than 5 years with segmental pneumonia the pneumococcus was the predominating organism in only 5 cases, *Staph. aureus* being predominant in 4, hæmolytic streptococci in 2, and hæmophilus in 1.

In the bronchopneumonia group all five pathogens were isolated in proportions near the average, but only 62% of the swabs grew pathogens (see above). One boy, aged 7 years, with extensive bronchopneumonia and profuse purulent sputum gave a pure growth of *Escherichia coli* repeatedly.

In the bronchiolitis group the proportion of swabs growing pathogens was about the same as in the group of segmental pneumonia. The two groups differ in that group-A streptococci were commoner in segmental pneumonia and coliform bacilli commoner in bronchiolitis. These differences may be associated with the high proportion of babies aged less than 1 year in the bronchiolitis group. Healthy children show a higher incidence of coliform bacilli and a lower incidence of hæmolytic streptococci in their throats in the first year of life than in later years (Masters et al. 1957).

In the group comprising laryngitis, tracheitis, and bronchitis only 57% of the swabs grew pathogens, and half of these were hæmophili, a higher proportion than in any of the other groups.

Serology

Table VI shows the serological results in the 92 cases tested for influenza A, B, and C and for the adenoviruses. These indicate positive findings connected with known viruses, and significant titres were found in 27% of them. However, in examining these figures it is necessary to keep in mind that probably a number of viruses which are either unknown or cannot be tested serologically, are commonly concerned in the acute respiratory illnesses, in particular the common cold. Therefore it cannot be said that viruses played no part in the ætiology of the remaining 73%.

Table VI shows that every kind of clinical picture is associated with each of these viruses, and there does not seem to be any specific clinical picture which would favour the diagnosis of one particular virus infection.

TABLE VIII—PROPORTION OF CHILDREN CLASSIFIED AS SEVERELY OR VULNERABLY ILL IN RELATION TO CLINICAL CATEGORY AND AGE-GROUP

Disease	Proportion of children aged (yr.)			Total
	<1	1–4	5 or more	
Segmental pneumonia	3/7	5/22(23%)	3/17(18%)	11/46(24%)
Broncho-pneumonia	11/17(65%)	9/36(25%)	1/2	21/55(38%)
Bronchiolitis	18/27(67%)	5/15(33%)	1/9	24/51(47%)
Others	2/14(14%)	1/18	1/7	4/39(10%)
Total	34/65(52%)	20/91(22%)	6/35(17%)	60/191(32%)

In this table children vulnerably ill are considered together with those seriously ill. In fact, however, they numbered only 9 cases and 8 were babies aged less than 1 year with bronchiolitis.

On the other hand, there is a definite increase in the percentage of positives to these known viruses with increasing age; the numbers are too small to draw any conclusions about the individual viruses at different ages.

The second half of table VI does not give any positive help in the ætiology of the bronchiolitis of infants, and it seems that if viruses are concerned in the causation of this condition, they are at present unknown or belong to the common-cold group.

During the third winter 42 cases were also tested for the Sendai virus, and 7 of these gave positive results to the hæmagglutination inhibition test; this indicates that this new virus plays some part in children's respiratory illnesses. However, these 42 cases were a selected group because they comprised those in which enough serum was left over from the other tests, thus automatically excluding most of the babies and those who were positive to another virus.

Hæmatology

Anæmia, defined as a hæmoglobin level below 11 g. per 100 ml., was present in nearly a third of the children and in nearly half of those aged less than 2 years. Anæmia is also common in other young children tested at Paddington Green Children's Hospital; hence the significance of the association between anæmia and acute respiratory infection is uncertain.

The polymorph counts and E.S.R. were correlated with age, clinical category, isolation of a pathogen from the cough swab, and response to chemotherapy. There were no consistent relationships, but there was a tendency for polymorph counts and E.S.R. to be higher in the older children, in segmental pneumonia, and in association with the isolation of a pathogen and a response to chemotherapy. Table V shows this tendency for polymorph counts in relation to age and clinical group. Although polymorph counts of more than 5000 per c.mm. were nearly always associated with the isolation of a pathogen and a good response to chemotherapy, many children with a normal polymorph count and only slightly raised E.S.R. yielded a pathogen from the cough swab and responded to chemotherapy.

The conclusion from this series is that the blood picture is an inadequate guide to the type of infection and the likelihood of response to antimicrobial drugs.

Chemotherapy

Table IV shows a definite trend in the infants aged less than 1 year in that the specific response to chemotherapy is greater in segmental pneumonia and bronchopneumonia and less in the other two groups. On the other hand, complete absence of response was observed in all the clinical groups and at all the ages, and a considerable number of cases in groups B, C, and D showed partial improvement after chemotherapy or improvement which was rather slow and was not judged clinically to be specific.

The overall clinical impression, which is supported by the lack of correlation between pathogens isolated,

raised polymorph count, and response to chemotherapy, is that, whatever the clinical picture or the age of the child, some antimicrobial drug is indicated; this is so even when a predominantly "virus" picture is present—e.g., in obstructive bronchiolitis in an infant—because secondary bacterial pneumonia is common and may prove fatal.

Severity of Illness

Table VIII shows the relationship of severe and vulnerable degrees of illness to age and clinical group, and it is evident that babies aged less than 1 year with either bronchopneumonia or bronchiolitis are the most ill. Of the 9 children in the whole series who were classified as vulnerably ill 8 were babies aged less than 1 year with acute bronchiolitis, and all were ill because of severe anoxia.

Discussion

In Brennemann's *Pediatrics*, J. M. Adams advocates an ætiological classification of the respiratory infections of childhood. Even though, in recent decades, new "entities" have been described there is insufficient clarity on the subject to make possible the use of an ætiological classification in this series. Accordingly a classification based on main clinical features was adopted as provisional to examination of the data. The four clinical groups are not sharply demarcated, because many children had evidence of fairly diffuse involvement of the respiratory tract, and the bacteriological and serological results have shown a very heterogeneous picture without any particular relationship to clinical group.

The fundamental conception of respiratory disease as comprising distinct entities, each with its specific ætiology, natural history, and clinical picture, awaiting recognition, may have to be discarded in favour of one less systematised. Manson (1953) suggested that the clinical picture could be better correlated with the site than with the agent of infection; the data presented here support the idea that the age of the patient determines his reaction to invasion.

There is also much to support Adam's suggestion that the primary infection is with a virus, and that bacteria are usually secondary invaders. The fact that Garrow and Fawcett (1949) could not relate the incidence of respiratory illness in young children to a current epidemic of influenza A is irrelevant because the present series shows clearly that probably many viruses are involved. Indeed, there must be a considerable number of viruses which are either not yet recognised or cannot be tested for; in the latter group the varieties of the common cold probably warrant serious consideration, particularly in relationship to the illnesses of infants.

It seems reasonable to postulate that, at any age, a virus infection causes an inflammation of the respiratory tract varying in extent and severity in proportion to the youth of the child.

In the young infant bronchiolitis can produce severe illness from obstruction and anoxia within 24 hours and before secondary bacterial infection has gained much ground.

In the slightly older child tracheobronchitis and bronchiolitis of non-obstructive type encourage secondary bacterial invaders, with the frequent production of bronchopneumonia.

In the still older child the virus infection is often so mild as not to attract much attention until some partial atelectasis, due probably to a plug of mucus, paves the way for a bacterial segmental pneumonia.

All three clinical pictures can occur in every age-group (although the predominant ones are as indicated above), and all can be associated with various types of pathogenic bacteria in the cough swabs and with positive serological results to known respiratory viruses of different types. These findings indicate that there is no hard and fast ætiological demarcation between the different clinical conditions.

Summary

Data are presented from an investigation of 191 cases of acute respiratory illness in children, severe enough to warrant their being admitted to hospital. The material was collected over three winters (1953–56).

As a provisional basis for discussion the cases were divided into four clinical groups according to the predominant clinical characteristics: (1) segmental pneumonia, 46 cases; (2) bronchopneumonia, 55 cases; (3) bronchiolitis, 51 cases; and (4) simple bronchitis, tracheobronchitis, and laryngotracheitis, 39 cases.

A highly significant correlation between the age of the child and the predominant clinical picture was found: the commonest illness in infants aged less than 1 year was bronchiolitis, in those aged 1–5 years bronchopneumonia, and in those aged more than 5 years segmental pneumonia. Laryngitis, tracheitis, and bronchitis were distributed equally among the different age-groups.

Bacteriological examination was essentially centred on a supralaryngeal swab taken, so far as possible, after coughing and before the institution of chemotherapy. The common pathogens isolated were *Staph. aureus*, hæmolytic streptococcus, pneumococcus, *H. influenzæ*, and coliform bacilli. There was no particular correlation of any of these with type of clinical picture, but the staphylococci and the coliform bacilli were commoner in infants aged less than 1 year, and *H. influenzæ* was commoner in the older children.

Serum was collected from 92 children and tested for influenza virus A, B, and C and for the adenoviruses. 27% showed a significant rise in titre or a high convalescent titre. There was no relationship between any one of these viruses and a particular clinical picture or age-group, but the proportion of positive results as a whole was considerably higher in the older children. A preliminary group tested against Sendai virus produced 7 positives in 42 tests, indicating that this virus is worthy of attention.

Blood was examined in 90% of cases. The white-cell counts were surprisingly unhelpful and in practice proved to be a very inadequate guide to the type of infection and to the likelihood of response to chemotherapy.

Antimicrobial drugs were given in almost every case, and the overall clinical impression was that, whatever the clinical picture or the age of the child, chemotherapy is indicated, even with a predominantly "virus" picture, because of the danger of secondary bacterial pneumonia. Chemotherapy may, however, be of secondary importance to oxygen therapy in infants with severe hypoxia associated with obstructive bronchiolitis.

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THE DISTRIBUTION OF BLOOD-GROUP SUBSTANCES IN HUMAN GASTRIC AND DUODENAL MUCOSA

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BLOOD-GROUP substances are widely distributed through the organs and tissues of the body (Wiener 1943). An unduly high proportion of patients with rheumatic fever are non-secretors of ABH blood-group substances (Glynn et al. 1956a). This link between a connective-tissue disease and the blood-group substances suggested an investigation of their distribution in the body tissues by the fluorescent-antibody technique of Coons for their accurate cellular or intercellular localisation.

The best available fresh human tissue on which to test this method was gastric mucosa from partial-gastrectomy specimens, and with this satisfactory results were obtained. In view of the recently demonstrated relationship between the frequencies of blood-group characters and of gastric neoplasms (Aird et al. 1953) and duodenal ulcers (Clarke et al. 1956), these results are described here.

Materials and Methods

Blood-group substances and antisera.—Samples of purified blood-group substances (obtained from ovarian-cyst fluids) were kindly given by Prof. W. T. J. Morgan, of the Lister Institute of Preventive Medicine. Saline solutions of these were used to coat vaccines of group-A hæmolytic streptococci which were injected intravenously into rabbits. This immunising technique has previously been described (Glynn et al. 1956b). Potent precipitating antisera were prepared in this way against A-substance, Lewis^a substance (Le^a), and H-substance. The accompanying table shows the precipitin reactions of these sera with the blood-group substances used in their preparation.

Conjugation of antisera.—The method of preparing fluorescein-labelled antisera and their use in "staining" tissue for specific antigens closely followed that of Coons and Kaplan (1950). Briefly, fluorescein isocyanate is added to a reaction mixture containing the globulin fraction (obtained by precipitation with ammonium sulphate) of the specific antisera. The resulting fluorescein-globulin conjugate is dialysed and absorbed with a dried organ powder to remove non-specific staining elements. In the present case the absorbing powder was made from the livers of those rabbits whose tissues lack the A-like antigen present in some other rabbits.

Preparation of tissue sections.—Fresh group-A and group-O stomach tissue was obtained from specimens removed at operation for partial gastrectomy. These provided material representative of the body of the stomach, the prepyloric region, and the beginning of the first part of the duodenum. Tissue blocks were cut from these three regions, placed in 'Pyrex' tubes, and frozen instantly in solid CO_2-acetone mixture. The tubes were then transferred to a cryostat cabinet, at −15°C to −20°C, where the tissues remained frozen solid. The cryostat accommodates a microtome, so that sections of frozen tissue may be cut and transferred to slides without thawing. Once on a slide the section is thawed by touching the undersurface of the slide with a finger, when the section thaws and adheres firmly to the glass. The slide may then be withdrawn from the cabinet and dried at room-temperature.

Staining.—Properly absorbed conjugates were used to stain tissue sections. The section was covered with one or two drops of conjugate and allowed to stand for half an hour at room-temperature under a petri-dish lid containing moist filter-paper. The conjugate was then drained off, and the slide washed by immersion in buffered saline solution (pH 7·0) in a Coplin jar for 15 minutes. Sections were mounted in glycerol containing 10% buffered saline solution.

Tests for specificity of staining.—Sections cut and stained in this way were viewed with a microscope illuminated by a compact-source 250-W high-pressure mercury-vapour lamp with good emission in the ultraviolet waveband. A Wood's-glass filter and copper-sulphate cell were used to absorb visible light. Areas in the section where fluorescent antibody has specifically combined with antigen have a bright apple-green fluorescence. The usual tests of the specificity of this reaction for a particular antigen include the inhibition of the fluorescence by pretreatment of the section with unconjugated specific antiserum, but in many cases complete inhibition of the conjugates by this method was not achieved, owing to the very large amounts of blood-group antigens present in the tissues. Instead, reduced intensity of staining by pretreatment with homologous unconjugated antiserum was as much as could be achieved, except in the case of the staining of the relatively scanty parietal cells (described below), where full inhibition with non-fluorescent homologous serum was possible. Specificity was further controlled by knowledge of the patient's blood-group—e.g., anti-A serum did not stain group-O and group-B gastric mucosæ. In the case of anti-Lewis serum specificity was controlled by the knowledge of the secretor status of the patients determined by anti-Le^a agglutinating serum or by a saliva-precipitation test (Glynn et al. 1956a). In addition the in-vitro precipitin cross-reactivity of the sera was known to be minimal (see table).

PRECIPITIN REACTIONS OF BLOOD-GROUP-SUBSTANCE ANTISERA

Antisera	Blood-group substances			
	A	Le^a	H	Le^{b}*
	(203/112/1)	(199/1)	(93/53)	(172/123)
Anti-A	++++	0	0	0
Anti-Le^a	0	++++	0	0
Anti-H	(+)	(+)	++++	++

* This preparation showed both H and Le^b activity.
Precipitin reactions (++++ – 0) show the best reaction between neat antisera and antigen dilutions in the range 10^{-2}–10^{-5}.

Results

Using the fluorescent-antibody technique we examined 16 stomachs (7 group-A, 1 group-AB, and 8 group-O).

A-SUBSTANCE AND LE^a SUBSTANCE

Body of Stomach

By conventional histological methods two zones may be seen in a cross-section of the mucosa in this region. The superficial zone consists of the gastric pits (foveolæ gastricæ) which are lined with columnar epithelium (containing mucin granules) similar to and continuous with that of the surface. The second (deeper) zone contains the gastric glands proper, several of which open into the bottom of each gastric pit. Each gastric gland consists

of three types of cell: the mucous neck-cells, the principal (zymogenic) cells, and the parietal cells; a fourth (argentaffine) type of cell is occasionally seen.*

Fig. 1 shows the appearance of body mucosa taken from a group-A secretor and stained with fluorescein-labelled anti-A serum. The epithelium of the surface and of the gastric pits is brilliantly stained; in the superficial parts every cell is swollen with blood-group mucoid, but towards the bottom of the gastric pits the amount of stained material in each cell tapers off. The mucous neck-cells are difficult to identify with certainty, but they also appear to contain A-substance, which is concentrated at the luminal end of the cells. The cytoplasm of the rest of the cell is stained less brightly, and the nucleus is outlined as a dark space. The principal cells of the deeper parts of the gland are not stained, but in contrast the parietal cells fix the antibody and stand out clearly (figs. 1 and 2). Pretreatment of the section by immersion in 90% alcohol for half an hour abolishes the staining of the parietal cells but leaves unaffected the staining properties of the superficial zone and of the mucous neck-cells (fig. 3).

Treated with anti-A conjugate the body mucosa of group-A and group-AB non-secretors shows no staining of the epithelium of the surface or of the gastric pits (fig. 4).

* Terminology follows the description of intestinal mucosa given by Maximow, A. A., Bloom, W. Textbook of Histology. 4th ed., Philadelphia, 1944.

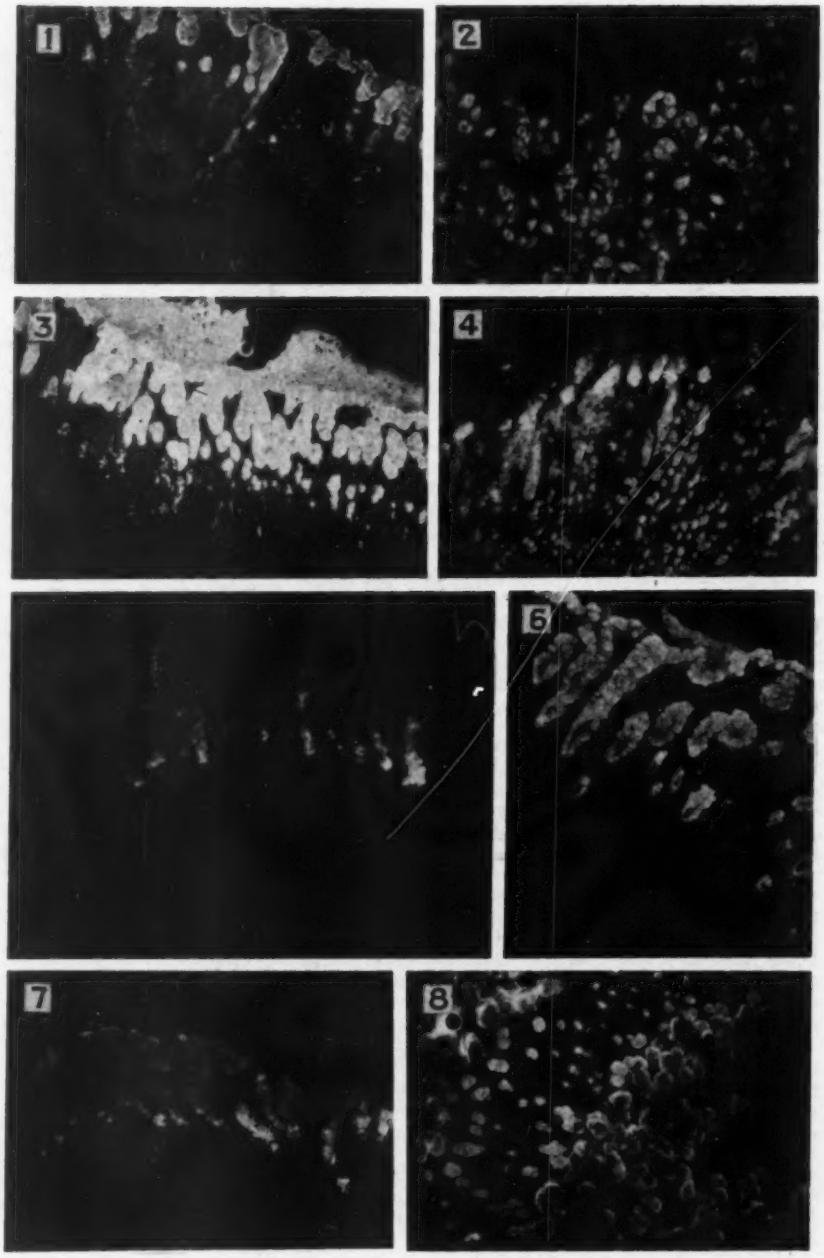

Fig. 1—Group-A secretor's body mucosa stained with anti-A conjugate: superficial zone strongly positive for A-substance; parietal cells also positive (×30).

Fig. 2—Horizontal section of deeper zone showing parietal cells containing A-substance in group-A body mucosa (×59).

Fig. 3—Group-A secretor's body mucosa treated with 90% alcohol before staining with anti-A conjugate: parietal cell-staining abolished; mucous neck-cells and superficial epithelium still stain (×30).

Fig. 4—Group-AB non-secretor's body mucosa stained with anti-A conjugate: superficial zone negative, neck-cells positive, parietal cells positive for A-substance (×35).

Fig. 5—Group-AB non-secretor's body mucosa (consecutive section to that in fig. 4) treated with 90% alcohol and stained with anti-A: parietal cell staining abolished; neck-cells still stain (×35).

Fig. 6—Group-AB non-secretor's body mucosa stained with anti-Le^a conjugate: superficial zone alone stains (×47).

Fig. 7—Same section as in fig. 5 restained with anti-Le^a conjugate (section is now stained for both A and Le^a substances): Le^a staining is unaffected by alcohol treatment (×35).

Fig. 8—Group-A secretor's pyloric region (surface of mucosa at top left-hand corner): both superficial epithelium (surface and foveolae) and deeper pyloric glands proper stain brightly for A-substance (×30).

At the mouths of the gastric glands proper a few cells, apparently the mucous neck-cells, stain specifically and brightly for A substance, giving the appearance of a bright narrow horizontal band dividing superficial and deep zones. The parietal cells also stain exactly as in secretor mucosa, and alcohol treatment similarly abolishes their ability to fix fluorescent anti-A globulin (fig. 5).

Anti-Le^a conjugate stains secretor mucosa only faintly or not at all. Such positive staining as occurs affects only the superficial zone.

In group-A and group-AB non-secretor issue the epithelium of the surface and gastric pit linings (which is negative with anti-A conjugate) stains brightly with anti-Le^a conjugate (fig. 6). This staining ceases abruptly at the mouths of the gastric glands proper and seems not to involve the region of the mucous neck-cells ; the parietal cells also are definitely negative. Fig. 7 shows that the Le^a staining is not abolished by pretreatment of the section with alcohol.

Pylorus

In the pyloric region the gastric pits (or foveolæ) reach deeper into the mucosa, half-way through its thickness. The pyloric glands of the deeper zone are of the simple branched tubular type, considerably coiled, and showing only one type of secretory cell.

In group-A secretors the mucosa of the surface and gastric pits stains brightly with anti-A conjugate (fig. 8) ; the appearance is of numerous granules of blood-group substance bulging out of the cells. (Sections are cut 6μ thick ; hence many cells are cut across.) The amount of staining diminishes towards the bottoms of the foveolæ. In the deeper zone the pyloric glands stain very brightly, and this appears to involve all the cells of the gland—a contrast to the state of affairs in the body glands, where the principal (zymogenic) cells are not stained. Alcohol treatment before staining does not affect the result (fig. 9).

In the non-secretor pylorus the surface mucosa and most of the lining epithelium of the foveolæ remain unstained by anti-A conjugate. Staining begins near the bottom of the foveolæ and increases in brightness with depth, until at the pyloric glands the extent and brightness of staining is as great as in secretor mucosa (fig. 10).

As in the body of the stomach, pyloric secretor mucosa does not stain at all with anti-Le^a serum,

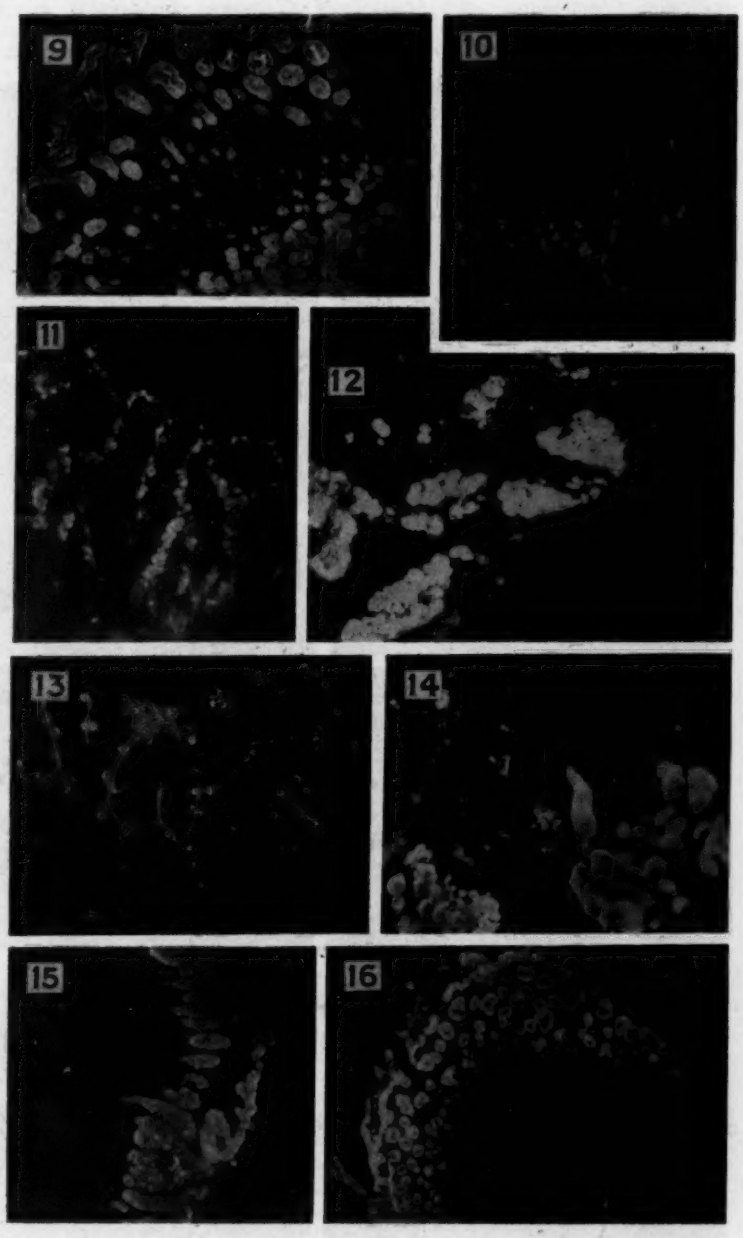

Fig. 9—Group-A secretor's pyloric mucosa treated with 90% alcohol before staining : no effect on A-staining (×34).

Fig. 10—Group-A non-secretor's pyloric mucosa : superficial zone negative with anti-A conjugate ; pyloric glands proper positive for A-substance (×34).

Fig. 11—Group-A secretor's superficial zone (villi) of duodenal mucosa : goblet cells strongly positive for A-substance ; villi outlined with thin layer of A-substance ; Brunner's glands not shown (× 34).

Fig. 12—Group-AB non-secretor's duodenal mucosa stained with anti-A : villi and crypts (bottom right) negative ; Brunner's glands strongly positive (×34).

Fig. 13—Group-AB non-secretor's duodenal mucosa stained with anti-Le^a : goblet cells strongly positive ; columnar epithelium negative ; lumina of crypts are outlined by thin film of A-substance (×34).

Fig. 14—Group-A secretor's duodenal mucosa treated with 90% alcohol : staining of goblet cells, outlining of villi, and staining of Brunner's glands not affected (anti-A conjugate) (×34).

Fig. 15—Group-A secretor's body mucosa stained with anti-H conjugate : superficial zone alone stains (×34).

Fig. 16—Group-O secretor's body mucosa stained with anti-H : superficial zone positive ; parietal cells negative (×34).

or at best very faintly, and only in the superficial zone.

In non-secretor mucosa the pyloric glands proper do not stain for Le^a substance. In contrast, the foveolar and surface epithelium stain brightly, in a manner similar to that seen in body mucosa stained with anti-Le^a conjugate.

Duodenum

In the first part of the duodenum the villi are covered by columnar epithelial cells between which goblet cells are scattered. Goblet cells occur also in the crypts of Lieberkühn, into which open the coiled and branched tubules of the duodenal glands of Brunner, which are lined with cuboidal epithelium.

In secretor mucosa the goblet cells of the villi and crypts are filled with A-substance; the principal columnar cells of the epithelium do not stain, or stain only faintly. A thin line of bright fluorescence follows the contour of the surface and outlines the lumina of the crypts; this appears to represent the secretion of the goblet cells which has flowed out to cover the whole epithelial surface with a thin coating of A-substance (fig. 11). Brunner's glands stain brightly and uniformly.

In non-secretor mucosa no staining of the villi and crypts is seen with anti-A conjugate, but Brunner's glands stain as brightly as in a secretor (fig. 12).

In secretors, Brunner's glands are uniformly negative for Le^a substance. The villi and crypts may show faint staining, again confined to goblet cells and epithelial surface.

In non-secretors stained for Le^a substance the brilliance of the goblet cells and the covering of the whole epithelial surface with a thin layer of specific blood-group substance are striking (fig. 13). In the superficial zone everywhere an A secretor stains for A-substance, and the non-secretor counterpart stains for Le^a substance instead. In the deeper zone of Brunner's glands, however, anti-Le^a conjugate gives rise to no specific staining. None of the blood-group

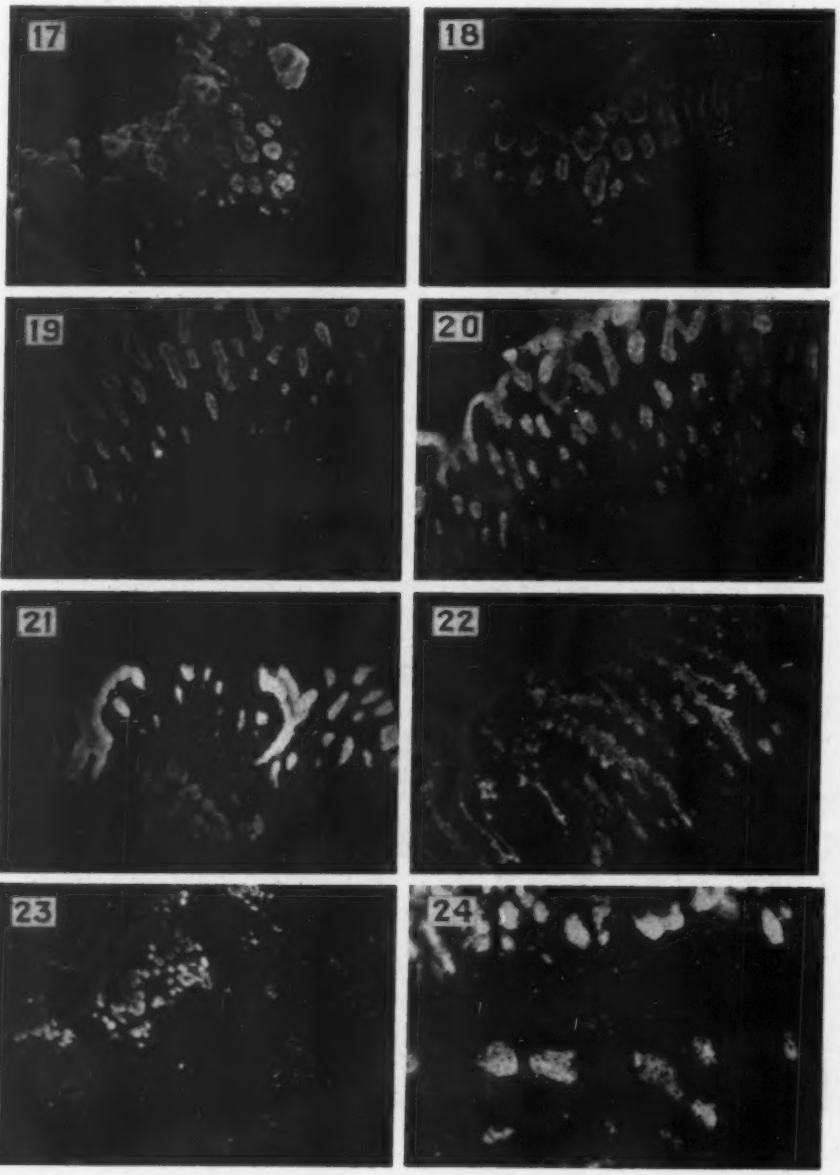

Fig. 17—Group-O non-secretor's body mucosa stained with anti-Le^a: as in a group-A or group-AB non-secretor, superficial zone is positive for Le^a substance (×30).

Fig. 18—Tissue from same block as fig. 17 treated with anti-H conjugate, which stains same cells as anti-Le^a (×30).

Fig. 19—Group-O non-secretor's pyloric mucosa stained with anti-H: positive in superficial-zone cells alone (×30).

Fig. 20—Group-O non-secretor's pyloric mucosa stained with anti-Le^a: positive in superficial-zone cells alone (×30).

Fig. 21—Group-O secretor's pyloric mucosa stained with anti-H: deeper pyloric glands proper are also positive (×24).

Fig. 22—Group-O non-secretor's duodenal mucosa stained with anti-Le^a: villi outlined with Le^a substance and goblet cells Le^a-positive; Brunner's glands negative (×24).

Fig. 23—Group-O secretor's duodenal mucosa stained with anti-H: villi and crypts negative; Brunner's glands positive in region of muscularis mucosæ only (×24).

Fig. 24—Group-A secretor's carcinoma of body of stomach stained with anti-A: metastatic cancer cells in muscularis mucosæ positive for A-substance (×59).

material found in the duodenum was alcohol soluble (fig. 14).

H-SUBSTANCE

The A and B blood-group substances are usually regarded as specific products of the *A* and *B* genes and occur in water-soluble form in the saliva and intestinal secretions of secretors carrying the corresponding genes. Persons belonging to group O secrete a substance neutralising anti-sera which agglutinate O cells preferentially. This substance is, however, also secreted by persons of groups A and B, as well as by A_1B individuals, who (according to Bernstein's generally accepted theory of inheritance) do not possess an O gene. Morgan and Watkins (1948) have called this mucoid H-substance to indicate its heterogenetic nature, which is apparently independent of the ABO group of the individual.

Body of Stomach

Mucosa from group-A, group-AB, and group-O individuals, both secretors and non-secretors, was examined, and in all cases, irrespective of group and secretor status, the epithelium of the superficial zone of the mucosa—i.e., surface and gastric pits—stained brightly with anti-H serum. Fig. 15 shows the mucosa from an A secretor, and fig. 16 that from an O secretor. In neither case are the parietal cells stained. Fig. 17 shows the mucosa from an O non-secretor stained positively with anti-Le^a serum, and fig. 18 shows body mucosa from the same individual staining also with anti-H conjugate. As mentioned above, the anti-Le^a serum did not stain (or only very faintly stained) secretor mucosa; its specificity was clearly different from that of the anti-H conjugate, as the precipitin tests in the accompanying table show.

Pylorus

This unexpected coexistence of Le^a specificity and H specificity in non-secretor mucosa was found also in pyloric specimens. Figs. 19 and 20 show pyloric mucosa taken from an O non-secretor and staining positively for both H and Le^a substance. In this specimen the pyloric glands proper were unstained by anti-H conjugate, but other O specimens have shown both faint and strong staining with anti-H conjugate in the deeper zone of the pyloric glands (fig. 21). Stained with anti-H serum the A specimens examined have shown the same variability, from negative to strongly positive. In all the specimens of pyloric mucosa examined, however, the superficial zone was stained with anti-H serum.

Duodenum

The staining pattern of villi and crypts with anti-H serum is very much less clear-cut than that of the superficial zones of the mucosa in body and stomach, and no close relationship has so far been found with the presence of A or Le^a substance. Fig. 22, for example, shows the duodenal mucosa of an O non-secretor stained typically for Le^a substance; but the same tissue with anti-H conjugate gave negative results; this is in contrast to the findings in the gastric mucosa. On the other hand, in an A secretor the goblet cells stained well for A and for H, yet Brunner's glands were positive only for A. Of five group-O secretor duodenal specimens three showed goblet-cells moderately positive for H-substance and in only two were Brunner's glands faintly positive (fig. 23). The other zones in all five specimens were unstained by anti-H conjugate. From the small number of specimens so far examined it seems that, in the duodenum, H-substance may be present in the superficial mucosal zone (villi and crypts) or in the cells of the glands of Brunner, but in some specimens it has been absent from one or both zones.

Discussion

These results show that the blood-group specific substances are distributed in the cells and strata of the gastric and duodenal mucosa according to clearly defined patterns, which are different in the two anatomical parts of the stomach which we have considered and in the duodenum.

These patterns are independent of the secretor/non-secretor phenomenon, which appears merely to determine one of the blood-group specificities present in the superficial zone alone of the mucosa. In the deeper zone the specificity of the blood-group substance is in part determined by the ABO group of the individual and is independent of the secretor status; but in both superficial and deep zones a third and variable factor, the presence or absence of H-substance, also affects the total pattern.

Anatomical Distribution

In the body of the stomach blood-group substance is present in very large amounts in the epithelium of the superficial zone (surface, foveolæ), but there is some tapering off in the mucous neck-cells. The blood-group substance in these two sites all appears to be present in the "water-soluble" form. The swollen appearance shown in the photomicrographs may be due to the imbibition of water and the bulging out of the cut cells. (Sections soaked in saline solution in the cold for twenty-four hours before staining show much increased swelling and extrusion of specifically staining substance which appears to be slowly passing into solution.)

In the deeper zone of the body mucosa the principal (zymogenic) cells apparently contain no specific A, H, or Le^a substance. Positive staining in this zone is confined to the parietal cells, which stain brightly and specifically for group-A substance in A persons, whether secretors or not. The A-substance in the parietal cells is of a different nature: it does not swell out of the cells, and it is soluble in 90% alcohol in a few minutes. (Preliminary work shows that when A-substance occurs as a connective-tissue element it occurs also in this alcohol-soluble form. Work on the distribution of blood-group substance in other tissues is still in progress.)

In the pyloric and prepyloric regions blood-group substance is found in both superficial and deep zones and is present in all the epithelial cells of foveolæ and pyloric glands. The amount is quantitatively greater nearer the surface and in the deeper parts of the glands, and less in the intermediate stratum. No alcohol-soluble substance has been detected in this region.

In the mucosa of the first part of the duodenum blood-group substance is again present in both the superficial zone (villi and crypts) and in the deeper zone (Brunner's glands). Although the epithelial cells of the villi are faintly positive, most of the blood-group substance is in the goblet cells and spreads out from these to cover the surface. There is less blood-group substance in the superficial mucosa of the duodenum than in the same zone of the stomach, and this is true for specimens from both gastric and duodenal ulcer cases. The staining of Brunner's glands, by contrast, closely resembles that of the convoluted pyloric glands, showing the same brilliant fluorescence which is independent of the secretor phenomenon.

In the superficial zone in all three regions examined the specificity of the staining is related to the secretor phenomenon.

Secretor Phenomenon

The difference found between secretor and non-secretor mucosa is simply a difference in specificity of part of the blood-group substance present in the superficial mucosal zone. In the stomach there is no apparent quantitative difference in the total amount of blood-group substance present. This difference in specificity is present in the superficial epithelium of the body, of the pylorus and of the first part of the duodenum, and consists in the fact that, where in an A secretor (for example) the cells of the epithelium stain positively for A-substance, in a non-secretor A-substance is absent and Le^a substance is present instead. This rule applies to all the superficial

epithelium but excludes the mucous neck-cells in the body. It should be noted that the superficial epithelium of secretors may also stain faintly for Le^a substance. This agrees with previous findings (based on saliva tests) that a high proportion of secretors also secrete small amounts of Le^a substance (Grubb 1951, Ceppellini 1955). Quantitatively, however, the amount of Le^a-positive staining in a non-secretor mucosa is unmistakably greater. The glandular epithelium of the deeper zone was never found to stain with anti-Le^a conjugate, whether in body, pylorus, or duodenum. The parietal cells are likewise Le^a-negative, and Lewis staining is never removed by pretreatment with alcohol.

H-Substance

The superficial gastric mucosa of both secretors and non-secretors stains brilliantly with anti-H conjugate, whether the tissue originates in group-O or group-A individuals. In neither group, therefore, does an anti-H conjugate differentiate between secretor and non-secretor; with the reagents used in the present work this difference may be distinguished in a group-O mucosa only by the use of an anti-Le^a conjugate. This demonstration of the presence of H-substance alongside Le^a substance in non-secretor superficial mucosa is somewhat surprising, because it has been shown that the saliva of non-secretors does not inhibit the anti-H lectins of (for example) gorse-seed extract (Boyd and Shapleigh 1954).

Our result might be attributed to anti-Le^b activity in the anti-H conjugate, but two considerations make this objection doubtful: (1) the serum was prepared against reasonably well-characterised H-substance, which showed little Le^b activity; and (2) Ceppellini (1954) has produced good evidence to support his view that Le^b substance is not secreted by ABO non-secretors, who lack the combination of secretor (S) and Lewis (L) genes. Nevertheless non-secretor mucosa was well stained by the anti-H conjugate. A difference between gastric and salivary secretion in respect of H-substance is therefore suggested by the present findings.

Though anti-H-conjugate sera never stain the deeper zone in the body mucosa they may do so in the pyloric and duodenal regions. The results of staining different specimens are variable, however, and in the duodenum this variability extends to the superficial epithelium of the villi and crypts. No parallel variability has been found in the duodenal staining for A and Le^a substance; so it may tentatively be suggested that in the duodenum this variability of H-staining is not the result of local peptic ulceration. There is no evidence of any causal relationship.

In the mucosa H-substance, like Le^a substance, is not alcohol-soluble and does not occur in the parietal cells of the body, even in group-O people. It might be conjectured that a "true" anti-O-serum conjugate would reveal the presence of alcohol-soluble O substance in these cells, and might also show whether there is any water-soluble O counterpart in those pyloric and duodenal glands of group-O people which stain faintly or not at all with anti-H serum.

Stomach Cancer and Peptic Ulcer

In one specimen of stomach cancer examined by the fluorescent-antibody method (an encircling carcinoma of the gastric body in a group-A secretor) the cancer cells stained specifically for A-substance. The metastatic nests and strands of cancer cells scattered through the stomach wall also stained brightly for A-substance (fig. 24), and this positive staining was abolished by pretreatment of the section with 90% alcohol. This result suggests that (in this instance at any rate) the production of blood-group substance by the cancer cells followed the pattern of the parietal cells rather than that of the superficial epithelium, producing an alcohol-soluble instead of a water-soluble substance. Future work may establish how far this finding is generally true of cancer cells in the stomach.

The 16 specimens examined were drawn equally from cases of gastric and duodenal ulcer. So far no obvious features distinguishing these two conditions have emerged from this cursory study of the distribution of the blood-group substances in the mucosa, but a detailed and careful comparison might well reveal important differences. All the material described above is of pathological origin, and the distribution patterns may be different in normal mucosa. There are difficulties, however, in interpreting appearances of "normal" mucosa obtained post mortem. For example, stomach tissue obtained at operation from an elderly patient of group A with gastric ulcer was inadvertently left at room-temperature for fourteen hours. When this tissue was cut and stained for A-substance, the parietal cells were negative, a change which may have been present initially but which may equally well have represented an artificial autolytic effect.

With this proviso it seems reasonable to suppose that the general pattern of distribution of the blood-group substances in the normal gastric and duodenal mucosa resembles that described above. Whether the variability of certain features which we have found is normal is not yet established, and may be worth further study. Clarke et al. (1956) have shown a probable relationship between duodenal ulcer and non-secretion and have suggested that the presence of blood-group substances in the duodenal secretion protects against duodenal ulcer. The present work suggests that secretion is merely the liberation of mucoid by the disintegration of the surface cells of the intestinal epithelium. In a group-A stomach, for example, these cells chiefly contain A-substance and H-substance in secretors, or Le^a and H-substance in non-secretors. In the duodenum, however, H-substance may be absent in either. This may be the quantitative difference leading to increased susceptibility that Clarke et al. postulate. One possibility is that in the duodenum a deficiency of H-substance is more closely related to non-secretion than to secretion. There is little suggestion of such quantitative differences in the stomach mucosa.

Summary

Conjugates of fluorescein isocyanate with anti-A, anti-Le^a, and anti-H sera have been used to identify blood-group substances in gastric and duodenal mucosa obtained from group-A, group-AB, and group-O persons undergoing partial gastrectomy.

The patterns of distribution of A, Le^a, and H substance in different parts of the mucosa and the difference between secretors and non-secretors are described.

In adapting the fluorescein antibody method to our purpose we received much initial help and advice from Dr. A. G. S. Hill. We wish also to thank Dr. A. H. Coons, in whose laboratory one of us (E. J. H.) gained additional experience of the method during the tenure of an Empire Rheumatism Council Travelling Fellowship. We are indebted to Dr. R. Consden for preparing fluorescein isocyanate and to the surgeons at this hospital and at Upton Hospital, Slough, for operation specimens; and to Mr. Peter Fiske, whose experience in the problems of photomicrography has been most helpful. This work was assisted by a Medical Research Council grant.

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COMBINED BARIUM MEAL AND CHOLECYSTOGRAPHY

REPORT ON 600 PATIENTS

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THE recent work of Dr. Alice Stewart and her collaborators (1956) has given the medical profession a timely though perhaps alarming reawakening to the hazards of radiation (*Lancet* 1956). The tremendous increase in the number of radiological investigations since the inception of the National Health Service has been the logical sequel of abundant re-equipment and upgrading of hospitals of all sizes and denominations. Generations of medical practitioners have now been brought up to scientific medicine and, driven by public demand, there seems to be little possibility that the modern doctor can reduce the number of requests for radiological investigations. We feel that the radiologist should give some positive lead in reducing the exposure to radiation, and

a *b*

Fig. 1—*a*, A layer of small floating non-opaque calculi; *b*, same after fat meal, showing contraction of the gallbladder. The calculi have been carried towards the cystic duct.

the purpose of this report is to put forward a technique of investigation of the alimentary tract which might be considered economical both in exposure to radiation and in attendances at the outpatient and X-ray departments.

The difficulties of making accurate clinical diagnoses in diseases of the upper abdomen are well known. Equally familiar are the stories of patients who attend hospital many times: first for consultation, then for X-ray investigation, which proves to be negative; the cycle is then repeated until something positive turns up or the entire sequence proves fruitless. There is nothing new in the suggestion that cholecystography should be combined with a barium-meal examination (Oakman 1928, Gianturco 1950, Elias 1952). We have long made a practice, when time, staff, and equipment permitted, of giving a barium meal to a patient with a normal cholecystogram. The value of such an ad-hoc measure was made evident when it was shown that 48% of patients referred for cholecystograms which proved normal were found to have disease of the upper alimentary tract (Johnstone 1941).

The first step was made towards the present technique when the preliminary film for cholecystography was eliminated, reducing the attendance to one morning only and the minimum number of films from three to two. As soon as it was evident that the value of the examination had not suffered, the next move was to use the cholecystographic medium for the dual purpose of demonstrating the gallbladder and acting as a purgative

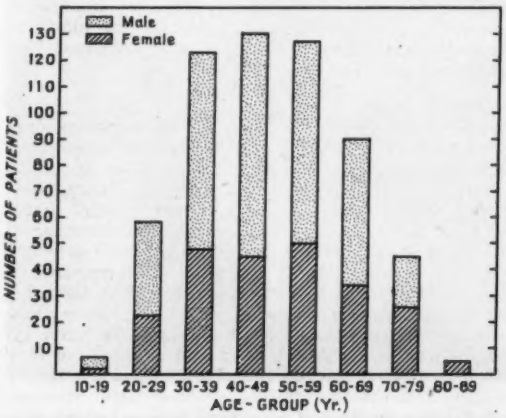

Fig. 2—Age and sex distribution of the 600 patients examined.

in the preparation for the barium meal. The preliminary instructions for the dual examination were drawn up to combine the essential requirements of each, and the following directions were given on making the first appointment:

INSTRUCTIONS FOR COMBINED CHOLECYSTOGRAPHY AND BARIUM MEAL

1. Take no food or drink containing fat after 6 P.M. on .....
2. Up to 10 P.M. you may eat:
   Lean meat, steamed fish, boiled potatoes, vegetables, stewed fruit, bread and jam.
   But no
   Eggs, fried articles, butter or margarine.
3. You may drink:
   Tea without milk, black coffee, fruit drinks and water.
4. At 10.0 P.M. take six tablets with a glass of water.
5. Take no food or fluid after 10 P.M. on.....
   Attend X-Ray Department at 9 A.M. for your examination on .....the.....day of.....
   You will be kept about two hours and may be required to attend in the afternoon and perhaps the next morning.
   When the examination is finished you are advised to take a big dose of aperient to clear the bowel of barium.

The Combined Examination

To illustrate the combined examination it may be best to follow the course of a patient from the time he arrives

DETAILED LIST OF RADIOLOGICAL FINDINGS ACCORDING TO SEX

Barium-meal findings	No. of patients	Normal gallbladder			Pathological gallbladder		
		Total	*Male*	*Female*	Total	*Male*	*Female*
Normal barium meal	238	215	*112*	*103*	23	*5*	*18*
Evidence of duodenal ulcer ..	186	179	*143*	*36*	7	*4*	*3*
Gastric ulcer ..	40	38	*23*	*15*	2	*1*	*1*
Carcinoma of stomach ..	15	14	*9*	*5*	1	*0*	*1*
Hiatus hernia ..	43	34	*18*	*16*	9	*2*	*7*
Evidence of gastritis	12	12	*9*	*3*	0	*0*	*0*
Duodenal diverticulum ..	14	11	*5*	*6*	3	*1*	*2*
Two or more of above lesions	9	7	*4*	*3*	2	*0*	*2*
Previous gastric operations ..	33	26	*24*	*2*	7	*2*	*5*
Miscellaneous ..	10	8	*6*	*2*	2	*0*	*2*
Total	600	544	*353*	*191*	56	*15*	*41*

Fig. 3—Extensive carcinoma of the stomach, involving pyloric antrum, causing obstruction. Cholecystographic medium has been retained in the stomach and outlines the irregular filling defect on the greater curvature.

for the radiological examination. Direct questions are asked to ascertain that the preparation has been carried out correctly and to obtain information about the action of the cholecystographic medium. In this series no side-effects have been reported except mild purgation. In a subsequent series 1 patient developed an urticarial rash within fourteen hours of taking the medium, and another patient had severe vomiting lasting three days. In both cases the patient had had previous cholecystography, using the same medium without ill effect.

Fig. 4—Two duodenal diverticula of moderate size partially outlined by cholecystographic medium given the night before. A faint gallbladder shadow can be identified.

The screen examination begins with a general survey of the chest and abdomen, and then the gallbladder shadow is sought. A small film may be exposed for a permanent record of the cholecystography, because barium in the duodenum may subsequently obscure detail.

A glass of ordinary barium emulsion is used in the initial part of the examination, and a second glass of barium mixed with milk is given to complete the filling of the stomach. The small amount of fat in 2–3 oz. of milk is quite sufficient to cause contraction of the gallbladder within half an hour. As it is routine practice to screen each patient after inspection of the films taken at the first examination, the time which must necessarily elapse is generally sufficient to show the response of the gallbladder, and an additional film may be taken to record the change. The quantity of milk used has not interfered with the emptying-rate of the stomach, and does not seem to have added to the difficulties of the investigation.

An important technical advantage of this method is that it ensures that all gallbladders are radiographed in the erect position, which may bring to light a collection of small non-opaque calculi floating in the bile (fig. 1).

Results

In the first 600 combined examinations, 56 patients (9·3%) had pathological gallbladders—i.e., non-functioning, or functioning with demonstrable gallstones. 238 patients (39·7%) had a normal barium series, but 23 of these had evidence of gallbladder disease. Of the 362 patients who were found to have some abnormality of the upper alimentary tract, there was coexisting biliary-tract disease in 33 (see table and fig. 2). About 1 patient in 10 with normal barium series, and 1 in 11 with abnormal barium series, had a pathological gallbladder.

Fig. 5—Multiple calculi found in a well functioning gallbladder in a patient with a duodenal ulcer.

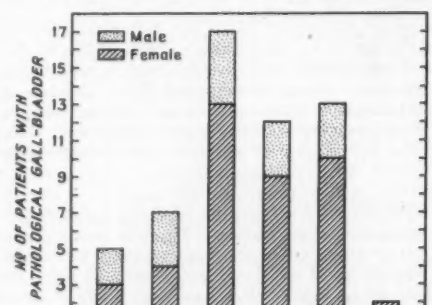

Fig. 6—Age and sex distribution of 56 patients with pathological gallbladders.

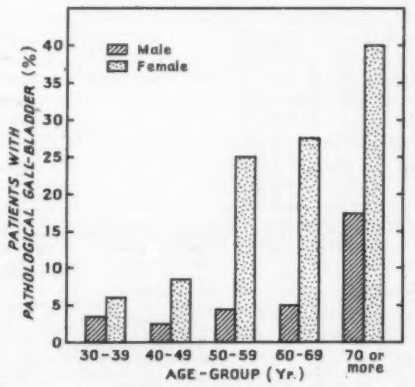

Fig. 7—Progressive prevalence of gallbladder disease with age, and higher prevalence in women.

There was no significant difference in the prevalence of gallbladder disease between the normal barium series and the abnormal series. We feel that the prevalence is high enough to justify the combined examination, quite apart from the time saved by the patient and hospital staff. In addition, the presence of cholecystographic medium in the stomach is a very good indication of delayed gastric emptying. It was seen in pyloric obstruction, caused by carcinoma and by duodenal ulceration, and in 2 patients the shadows were sufficiently characteristic to make the barium meal superfluous (fig. 3). It was also found in 1 patient who, nine years previously, had undergone vagotomy for duodenal ulcer, though there was no current mechanical obstruction at the pylorus. In several patients the medium gave an excellent demonstration of retention in duodenal diverticula, for these

Fig. 8—Subtotal gastrectomy six years previously, in a patient aged 59 years. Several subsequent barium-meal examinations showed no abnormality. Large non-opaque calculi were shown in the combined examination. Cholecystectomy has since been done, and the patient has improved since the operation.

could be clearly seen at the initial screening (fig. 4). We were also able to refute the commonly held view that cholecystography may be unsatisfactory or impaired by duodenal ulceration without stenosis (fig. 5).

We have made a statistical analysis of the incidence of a number of conditions demonstrated by this combined examination, making appropriate allowances for age and sex where necessary. The results confirm the higher prevalence of gallbladder disease in women and older patients (figs 6 and 7). The apparent association of hiatus hernia and gallbladder disease is misleading, and gallbladders were found to be abnormal as often in women over the age of 50, whether or not they had a hiatus hernia. Both conditions are commonest in the same age and sex groups and their association is coincidental. Similarly, gallbladder disease is associated only coincidentally with duodenal ulceration.

A number of patients who had previously undergone partial gastrectomy or gastroenterostomy were found to have gallstones, but it was not established whether these had all developed after operation (fig. 8). At first all patients attending for a barium meal had a simultaneous cholecystogram, but the negative cholecystographic findings in the first 64 patients under the age of 30 led us to abandon the combined examination for patients in this age-group. Care is also taken to avoid repeating the cholecystography when a barium meal is required for follow-up purposes. The cost of the cholecystographic media ranges from just below to just above 3*s*. Over a long period the total cost may seem high, but we feel that, considering the advantages we have mentioned, there is an ample balance to justify this interesting and often helpful technique.

ADDENDUM

2000 patients have now been examined by this technique, and of these 193 were found to have disease of the gallbladder. Of 960 patients with a normal barium series, 115 (12%) had diseased gallbladders. Of the 1040 patients with positive barium series, 76 (7·5%) had pathological gallbladders.

A fuller analysis of these figures will follow in a subsequent report.

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EFFECT OF AMPHENONE THERAPY ON URINARY EXCRETION OF ALDOSTERONE AND SODIUM IN HEPATIC CIRRHOSIS WITH ASCITES

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AMPHENONE B * was synthesised by Allen and Corwin (1950), and its structural relationship to synthetic œstrogens stimulated subsequent biological studies. The compound affects the adrenal glands, thyroid gland, and uterus in laboratory animals (Hertz et al. 1955, Tullner et al. 1956) and also influences endocrine function in man. Thyroid activity is altered by a depression of organic binding of iodine (Hertz et al. 1956), and the secretion of adrenocortical steroids is decreased (Hertz. et al. 1956,

* 3,3-di (*p*-aminophenyl) butanone-2 dihydrochloride (Korman and Olson 1957), manufactured and kindly provided by the Upjohn Company, Kalamazoo, Michigan, U.S.A.

TABLE I—CLINICAL AND BIOCHEMICAL FINDINGS IN RELATION TO AMPHENONE THERAPY

Case no.	Age (yr.)	Sex	Weight (kg.)	Time in relation to amphenone therapy	Serum-bilirubin (mg. per 100 ml.)	Serum-albumin (g. per 100 ml.)	Serum-globulin (g. per 100 ml.)	Cephalin flocculation	Bromsulphalein (% retained at 45 min.)	Serum-sodium (mEq. per litre)	Serum-potassium (mEq. per litre)	Serum-chloride (mEq. per litre)	Serum-non-protein nitrogen (mg. per 100 ml.)	Water tolerance	Response to mercurial diuretics* i.e., urinary sodium (mEq. in 24 hr.)	Remarks
1	57	M	78·9	Before	1·3	3·8	2·6	4+	29	130	4·3	100	32	10	2·2	Ascites accumulating despite treatment; anorexia, fatigue, retching, and transient impending hepatic coma with both courses of amphenone
				After 1st course	1·0	3·6	2·4	3+	35	131	4·6	95	38	16	..	
				After 2nd course	0·8	..	..	3+	..	131	5·8	102	30	..	..	
2	62	M	79·6	Before	1·6	4·0	1·4	3+	42	136	4·3	95	21	16	8·6	Ascites 2 yr. needing repeated paracentesis; nausea, diarrhœa, and impending hepatic coma with amphenone therapy
				After	1·8	3·6	2·8	3+	38	137	4·6	100	30	17	..	
3	40	M	105·0	Before	0·4	4·6	2·4	2+	42	138	4·3	99	20	30	27·7	Ascites responding to mercurial diuretics; no toxic effect of amphenone
				After	0·4	4·7	2·3	2+	37	139	4·5	101	19	19	..	
4	67	F	61·4	Before	0·6	3·3	2·1	2+	25	137	4·6	99	17	20	89·0	Ascites clearing on rest in bed and restriction of sodium; no toxic effect of amphenone
				After	0·2	3·1	5·0	3+	10	135	4·6	101	15	..	..	
Normal values					1·0	4·0	2·0	+	5	140	4·5	102	25	80	..	..

* Either mersalyl or mercapterin 2 ml. by intramuscular injection.

Thorn et al. 1956), probably owing to selective inhibition of steroid biosynthesis (Rosenfeld and Bascom 1956). Renold et al. (1957) have shown that amphenone therapy led to a decrease in the excretion of urinary aldosterone often associated with a sodium diuresis. Moreover, the excretion of aldosterone was decreased by doses which caused no significant change in urinary 17-hydroxy-corticoid levels.

The relative sensitivity of aldosterone secretion to amphenone suggests a therapeutic use for amphenone in conditions associated with increased production of aldosterone. The probable contribution of the sodium-retaining action of aldosterone to the formation of ascites complicating liver disease was emphasised by Luetscher and Johnson (1954) and Wolff and Koczorek (1955), who found increased amounts of aldosterone in the urine of such patients. A trial of amphenone therefore appeared important, and the results of its administration in 4 patients with ascites are reported here, with special reference to amphenone's effect on the excretion of sodium and aldosterone in the urine.

Material and Methods

Four chronic alcoholics (three men and one woman), aged 40–67, with hepatic cirrhosis and ascites were treated. The diagnosis was based on clinical and biochemical findings (table I) and supported by aspiration liver-biopsy in 2 patients. Careful supervision was continued throughout the trial.

The patients received a restricted amount (10 mEq. daily) of sodium in their diet, and their body-weight, abdominal girth, intake of fluid, and output of urine were repeatedly recorded. After a period of equilibration observations were made before, during, and after the administration of amphenone given in capsules (not enteric-coated) in divided doses throughout each day to a total of 11–18 g. in three or four days. Cases 1, 2, and 3 were given prednisone 30–50 mg. daily before, during,

TABLE II—24-HOUR URINARY EXCRETION OF SODIUM AND ALDOSTERONE IN RELATION TO ADMINISTRATION OF AMPHENONE AND PREDNISONE

Case 1			Case 2					Case 3					Case 4		
Therapy		Urinary excretion of sodium (mEq. per 24 hr.)	Therapy		Urinary excretion of			Therapy		Urinary excretion of			Therapy		Urinary excretion of sodium (mEq. per 24 hr.)
Prednisone (mg. per 24 hr.)	Amphenone (g. per 24 hr.)		Prednisone (mg. per 24 hr.)	Amphenone (g. per 24 hr.)	Sodium (mEq. per 24 hr.)	Aldosterone (μg. per 24 hr.) "Free"	Aldosterone (μg. per 24 hr.) "Conjugated"	Prednisone (mg. per 24 hr.)	Amphenone (g. per 24 hr.)	Sodium (mEq. per 24 hr.)	Aldosterone (μg. per 24 hr.) "Free"	Aldosterone (μg. per 24 hr.) "Conjugated"	Prednisone (mg. per 24 hr.)	Amphenone (g. per 24 hr.)	
..	..	0·4	..	..	0·7	35·0	20·0	..	..	0·5	36·0	14·0	..	..	30·0
..	..	0·3	..	..	0·5	5·5	2·5	..	..	0·3	..	..	..	..	44·0
..	..	0·4	..	..	0·3	..	..	..	..	0·8	25·0	22·0	..	..	42·5
..	5	0·3	..	..	0·8	..	..	..	..	0·5	..	..	..	3	31·5
										0·3					
30	..	1·6	..	..	8·6*	17·0	2·0	..	..	27·7*	21·0	18·0	..	4	17·5
30	..	11·8	..	..	0·7	..	..	..	..	0·3	..	..	..	4	25·0
30	..	7·8	50	..	1·4	5·0	26·0	50	..	0·5	59·0	10·0	..	..	25·0
30	5	2·4	50	..	2·0	8·0	0	50	..	0·2	30·0	..	..	..	11·7
30	6	6·4	50	..	10·6	35·0	4·5	50	..	0·4	15·0	2·0	..	..	10·9
30	6	27·6	50	5	12·9	0·5	2·5	50	4	0·8	2·5	4·0	..	..	..
30	1	66·3	50	6	14·6	2·0	0	50	5	0·7	4·0	5·0	40	..	13·1
30	..	45·5	50	6	12·9	2·5	1·5	50	6	0·9	0·5	5·0	40	..	10·6
30	..	1·8	50	..	43·5	6·5	..	50	..	0·4	5·0	25·0	40	..	14·6
..	..	0·6	30	..	81·2	4·0	..	50	..	1·0	20·0	20·0	40	..	16·9
..	..	0·2	15	..	21·1	..	..	..	..	..	..	..	40	..	23·6
..	..	..	..	..	1·9	..	..	50	..	0·5	..	..	..	..	..
..	..	..	..	..	2·5	..	..	50	..	0·5	..	..	..	..	..
..	..	..	..	..	..	..	..	50	..	0·8	..	..	..	..	..
..	..	..	..	..	..	..	..	25	..	0·5	..	..	..	..	..
..	..	..	..	..	..	..	..	10	..	0·3	..	..	..	..	..

* Mercapterin 2 ml.

Fig.

and after amphenone treatment to prevent excessive depression of adrenal function and the side-effects of amphenone. Cases 1 (for one day) and 4 received amphenone alone, and cases 3 and 4 had courses of prednisone after amphenone treatment had been given (table II).

Biochemical tests of liver function, blood-electrolyte levels, and urine-sodium levels were estimated by standard methods reported earlier (Phillips et al. 1952, Gabuzda et al. 1954). Water-tolerance tests were made by expressing four hours' output of urine, after a water load of 15 ml. per kg. of body-weight, as a percentage of the volume ingested.

Aldosterone was measured in 24-hour collections of urine by a physicochemical method closely related to that of Neher and Wettstein (1955, 1956) and extensively discussed elsewhere (Hernando et al. 1957). Since liver disease might interfere with the inactivation and conjugation of steroids, including aldosterone, the specimens of urine were extracted twice—immediately after acidification of the urine to pH = 1, and again forty-eight hours later. Undue exposure of free aldosterone to strongly acid conditions causing its partial destruction (Simpson and Tait 1955) was thus avoided. The fraction of aldosterone extracted immediately after acidification of the urine has been termed "free" aldosterone in contrast to "conjugated" aldosterone extracted after forty-eight hours.

Results

Important differences existed between the four patients. Cases 1 and 2 were both emaciated, with more grossly deranged liver-function tests and low serum-sodium levels, findings which suggest advanced liver disease (table I). In both patients the ascites was resistant to restriction of dietary sodium, and mercurial diuretics had a negligible effect. Case 1 was accumulating ascites, with increasing abdominal girth and body-weight, despite rest in bed and restriction of sodium; and case 2 had repeated paracenteses in addition to routine medical treatment. In contrast, cases 3 and 4 had less clinical or biochemical evidence of liver disease, and their ascites had accumulated suddenly after alcoholic excess. Each responded well to mercurial diuretics, and case 4 had a spontaneous sodium diuresis as a result of rest in bed and the withdrawal of alcohol (table II).

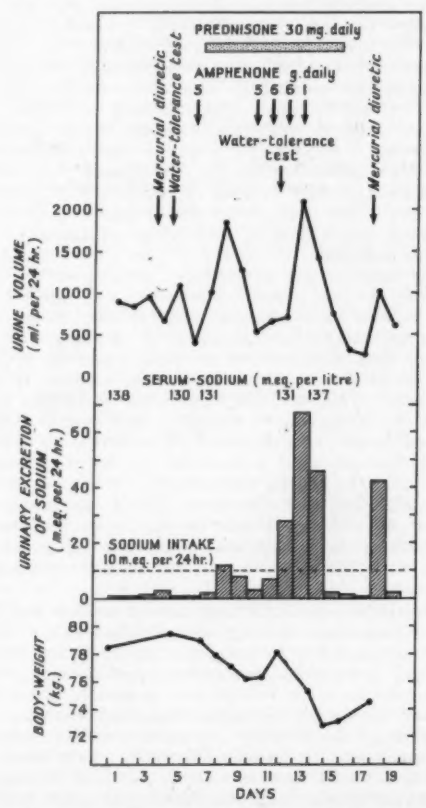

Fig. 1—Influence of amphenone on urinary excretion of sodium in case 1.

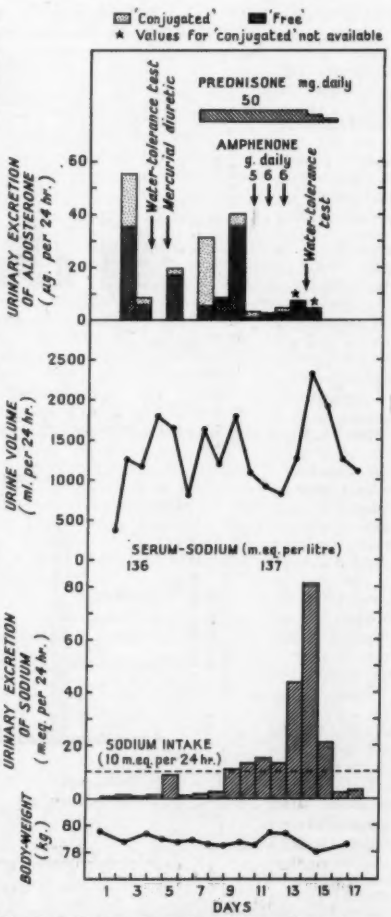
'Conjugated' 'Free'
★ Values for 'conjugated' not available
PREDNISONE mg. daily 50
AMPHENONE g. daily 5 6 6
Water-tolerance test
Mercurial diuretic
Water-tolerance test
URINARY EXCRETION OF ALDOSTERONE (μg. per 24 hr.)
URINE VOLUME (ml. per 24 hr.)
SERUM-SODIUM (m.eq. per litre) 136 137
URINARY EXCRETION OF SODIUM (m.eq. per 24 hr.)
SODIUM INTAKE (10 m.eq. per 24 hr.)
BODY-WEIGHT (kg.)
DAYS

Fig. 2—Influence of amphenone on urinary excretion of sodium and aldosterone in case 2.

Case 1 (fig. 1) was in a state of maximal sodium retention and had become refractory to mercurial diuretics. Amphenone 5 g. was given alone for one day but, owing to side-effects, had to be withdrawn, and prednisone was given. There followed a small sodium diuresis reaching a maximum of 12 mEq. per 24 hours on the second day and then falling. It is therefore uncertain whether amphenone or prednisone caused the increased urinary excretion of sodium. A definite sodium diuresis occurred when amphenone was reintroduced, with a maxiumm (67 mEq. per 24 hours) on the day of amphenone withdrawal and a sharp decrease to control levels two days later, despite the continuation of prednisone therapy (table II).

Case 2 (fig. 2) also retained sodium avidly and gave little response to mercurial diuretics. Prednisone was given first, and the urinary excretion of sodium increased to 10·6 mEq. per 24 hours on the third day. A much greater rise took place with amphenone therapy, with a maximum of 81 mEq. per 24 hours on the day after amphenone was withdrawn, by which time the prednisone dosage had been reduced. The administration of amphenone was accompanied by an immediate decrease in the urinary excretion of aldosterone, both "free" and "conjugated" fractions decreasing proportionally. During the control period, the excretion of aldosterone averaged 26 μg. in twenty-four hours, two-thirds of it being in the "free" form. Under treatment with amphenone the excretion of aldosterone decreased to 3 μg. in twenty-four hours,

with the "free" fraction still representing two-thirds of the total. Prednisone alone did not alter significantly the output of aldosterone; from three collections of urine before the administration of prednisone a mean value of 27 μg. in twenty-four hours was obtained, with a "free" fraction of 19 μg., whereas three collections of urine during prednisone treatment yielded a mean of 26 μg. in twenty-four hours, 16 μg. representing the "free" form (table II).

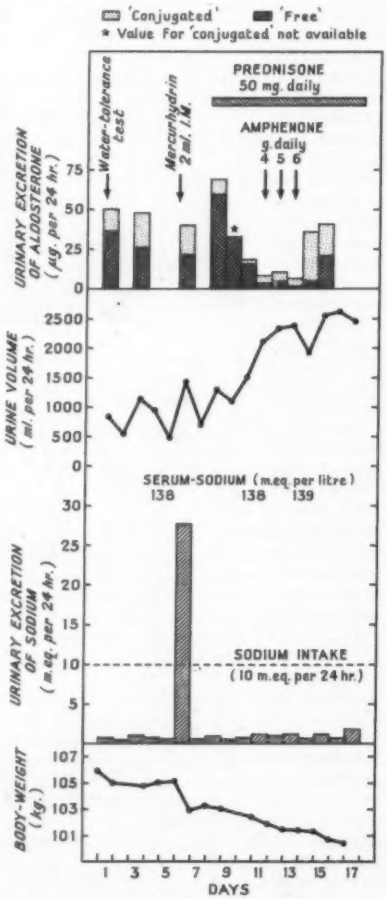

Fig. 3—Influence of amphenone on urinary excretion of sodium and aldosterone in case 3.

Case 3 (fig. 3).—Sodium diuresis did not occur with prednisone or when prednisone and amphenone were given together, but amphenone again produced an immediate and significant decrease in the urinary excretion of aldosterone. In addition, the ratio of "free" to "conjugated" aldosterone was reversed under treatment with amphenone. The "conjugated" fraction accounted for a third of the excreted total during the control period and for two-thirds while amphenone was given. The daily excretion of aldosterone during the control period averaged 44 μg. and after the withdrawal of amphenone there was a prompt return to high levels. Prednisone alone did not modify the urinary excretion of aldosterone, which averaged 46 μg. in twenty-four hours before, and 41 μg. per twenty-four hours during, prednisone therapy, although there was some decrease in the "conjugated" fraction when prednisone was administered. Loss of weight appeared in part to be related to excessive sweating, an unusual finding in patients with cirrhosis and ascites.

Case 4 had a spontaneous sodium diuresis, with loss of weight and reduction in abnormal girth, as a result of rest in bed and restriction of dietary sodium. Neither amphenone nor prednisone, each of which was given separately, affected the urinary excretion of sodium (table II).

Toxic Effects

Cases 1 and 2, in whom a response to amphenone was established, also exhibited toxic reactions to it. Anorexia, nausea, and lethargy developed during the first forty-eight hours of administration, and one patient complained of retching, and the other developed diarrhœa. Both patients experienced episodes of impending hepatic coma with the appearance of mental confusion and a "flapping" tremor. This occurred after only 5 g. of amphenone in case 1, but a second course of amphenone was better tolerated when prednisone was given simultaneously. The withdrawal of amphenone was followed by rapid recovery from these various side-effects. No effect of amphenone was observed on liver-function tests and serum-electrolyte levels. Water tolerance was impaired initially in all four patients; but, except for case 3, in whom amphenone did not affect the excretion of sodium, there was no evidence that amphenone influenced the excretion of water (table I).

Discussion

The mechanisms by which ascites is formed remain obscure, but it is likely that retention of extracellular fluid, at first due to portal hypertension and a low serum-albumin level, leads to an increased production of the sodium-retaining hormone aldosterone (Conn 1956), while inadequate metabolism of aldosterone due to impaired hepatic function may also be important in severe liver disease. Urinary aldosterone levels were high in both patients in whom they were estimated, because normal values averaged 5 μg. per twenty-four hours with the method used (Hernando et al. 1957), but the results were still within the range obtained in healthy people placed suddenly on low-sodium diets.

Further assessment of aldosterone metabolism is restricted without a reliable method of estimating levels in the blood, but changes in urinary values may reflect inadequate conjugation and inactivation of aldosterone, perhaps due to impaired hepatic function. This could explain the large proportion of "free" aldosterone in the urine of our patients with liver disease, thus supporting the finding of Axelrad et al. (1955).

The administration of amphenone produced an immediate and striking decrease in the urinary excretion of aldosterone towards normal levels in both patients studied. An appreciable sodium diuresis occurred under treatment with amphenone in two patients, but it was not immediately related to alterations in the urinary excretion of aldosterone. The difficulty in attributing the increased urinary excretion of sodium in these patients conclusively to amphenone is due to the complicating factor of prednisone therapy. Prednisone may sometimes cause a sodium diuresis in patients with cirrhosis (Muller et al. 1956), and a weak diuresis due to prednisone occurred in case 2, but no such effect was discerned in the other patients. When the present study was later repeated with longer preliminary prednisone therapy (Wolfe et al. 1957), sodium diuresis was again more closely related to amphenone therapy, but aldosterone was not estimated. On that occasion, as was our experience and that of Renold et al. (1957), sodium diuresis was often at its maximum soon after amphenone was withdrawn. This perhaps reflects the relatively short periods of amphenone therapy, and such delayed responses must be considered in interpreting results. The administration of prednisone did not significantly depress the urinary excretion of aldosterone, a finding in accord with that of Muller et al. (1956). In contrast, a lowering of urinary aldosterone levels in response to prednisone has been reported (Vesin et al. 1956), and the greater retention of sodium in our patients may be of importance in this respect.

The variable response to treatment of ascites complicating liver disease is well recognised (Sherlock 1955). When ascites accumulates in response to an acute episode —e.g., gastro-intestinal hæmorrhage, and alcoholic excess —improvement often follows rest in bed, a low-sodium diet, and correction of the precipitating factor. Some patients may also require mercurial diuretics to ensure an adequate sodium diuresis, whereas in others the ascites is resistant to all these measures. Lack of response to this treatment is usually associated with advanced liver disease and suggests a poor prognosis, especially when

associated with serum-sodium levels below 130 m.eq. per litre (Hecker and Sherlock 1956). These different clinical circumstances are represented in the present cases. Both patients in whom a sodium diuresis followed rest in bed, restriction of dietary sodium, and mercurial diuretics showed no response to amphenone. In contrast the two patients with more severe liver disease, in whom routine treatment was ineffective, had striking increases in 24-hour urinary excretion of sodium as a response to depression of adrenocortical function. This not only emphasises the contribution of adrenocortical hormones to the ascites but also suggests that they may be of greatest significance in the intractable ascites of advanced liver disease. Aldosterone is particularly important in this respect because clinical and biochemical evidence of increased production of other adrenocortical hormones in liver disease is rare. Moreover prednisone, which had little action alone, inhibits the other adrenocortical secretions by suppressing the endogenous release of corticotrophin.

Insufficient data are available from controls to compare the sodium diuresis in our patients with the "normal" response to amphenone. However, transient sodium diuresis in two patients and the absence of any effect in the others, despite the much decreased urinary excretion of aldosterone in both patients in whom it was measured, are consistent with observations in patients with hepatic cirrhosis submitted to bilateral adrenalectomy to control intractable ascites. Marson (1954) had to maintain his patient postoperatively on a low-sodium diet, combined with resins and intermittent mercurial diuretics, and improvement in the ascites was complicated by symptoms consistent with sodium depletion. A patient described by Werk et al. (1956) behaved in a somewhat similar fashion.

This trial indicates that medical suppression of aldosterone secretion is likely to benefit certain patients with ascites, although longer and more extensive studies were precluded by the present shortage of amphenone, and its use is also limited by toxic effects. Hertz et al. (1956), who gave rather larger doses than in the present study, emphasised the high incidence of drowsiness and gastro-intestinal symptoms, and two of their patients had impaired liver function after treatment. Although no clinical or biochemical effect on liver function was observed in the present study, both patients in whom amphenone produced a sodium diuresis developed transient impending hepatic coma. Disordered cerebral metabolism may exist in the absence of neuropsychiatric disturbance in severe liver disease (Summerskill et al. 1957), and hepatic coma may be precipitated suddenly by various toxic agents in these circumstances. Since such patients are those in whom amphenone treatment is most clearly indicated, its untoward effects constitute a great disadvantage. However, it should not be debarred unless adequate supervision is impossible, and it is anticipated that less toxic derivatives will become available.

Summary

Amphenone, which depresses adrenocortical function, was given to four patients with ascites complicating liver disease in divided doses totalling 11–18 g. in three or four days.

Two of these patients had more severe liver disease, and their ascites did not respond to rest in bed, restriction of dietary sodium, and mercurial diuretics. In both cases amphenone therapy was followed by an increase in urinary excretion of sodium from less than 1 mEq. to 60–80 mEq. in twenty-four hours.

Amphenone had no therapeutic effect in the other two patients, both of whom responded to routine treatment. The urinary excretion of aldosterone was increased in both patients in whom it was estimated, the unconjugated fraction being abnormally high, and levels fell promptly to normal when amphenone was given.

Prednisone, administered as a precaution against toxic effects, led to a small sodium diuresis in one patient but did not alter the excretion of aldosterone.

Amphenone had no effect on liver-function tests and serum-electrolyte levels, but both patients in whom the urinary excretion of sodium was increased developed transient impending hepatic coma.

Since increased production of aldosterone is of importance in ascites, depression of adrenocortical function by amphenone or drugs with a similar action should be considered in the treatment of intractable ascites.

We are grateful to Dr. C. S. Davidson and Dr. F. Avery Jones for allowing us to treat patients under their care; Prof. G. Thorn and Dr. A. E. Renold for encouraging this investigation and making available their advice, experience, and unpublished data about amphenone; Miss A. N. Ballou, Miss E. Hirschberg, and Mr. D. Rossington, for biochemical assistance; and Miss E. Antanaros, Miss M. F. Bradley, Miss E. Murland, and Mrs. A. M. Dawson for dietetic help. Prednisone ('Metacorten') was kindly provided by the Schering Corporation, Bloomfield, New Jersey.

This work was supported in part by the Office of the Surgeon General, Department of the (U.S.) Army, in part by the United States Public Health Service, in part by a grant from Merck and Co. Inc., Rahway, New Jersey, in part by a grant from Lederle Laboratories Division of the American Cyanamid Company, Pearl River, New York, to Harvard University, and in part by the Jane Coffins Child Memorial Fund for Medical Research, New Haven, Connecticut.

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"Co-operation between voluntary and statutory societies gives greater opportunity for consideration of the minority point of view. It allows room for diversity and initiative when the trends are all in favour of centralisation and unification, and insists on the value of individual effort in an era of large-scale organisation. It helps to spread interest in the social services amongst a wider section of the community, many of whom may not have a bent for service on statutory committees. . . . If generous use could be made of the power to grant-aid voluntary organisations for general purposes, in addition to payments for specific purposes, combined action could secure elasticity and experiment, together with efficiency and maintenance of standards."—MADELINE ROOFF, *Voluntary Societies and Social Policy*, p. 282; London, 1957.

LEAD POISONING IN NINE MEMBERS OF A FAMILY

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CERTAIN laboratory confirmatory tests are standard practice in the investigation of suspected lead poisoning. By and large, however, these tests merely reveal increased lead absorption, and the clinician is left to make his diagnosis on a correlation between these tests and the clinical findings. Since urinary lead excretion, urinary coproporphyrins, stippled-cell counts, blood-lead levels, and hæmoglobin content vary considerably with degree and length of exposure to lead (and vary differently in different individuals), the clinician can only take the general picture produced by the sum of these investigations and weigh it against his clinical appreciation of the patient's condition. As the patient's complaint may be coloured by his fear of lead poisoning and some knowledge of the symptoms, the clinician is often at a loss, in the absence of physical signs, to assess the true degree of poisoning. I here take lead poisoning to mean an extent of lead absorption that has produced pathological changes harmful to the health of the individual.

My purpose is to illustrate the response of the various laboratory tests in a family of eleven exposed to the same source of lead poisoning but in varying degree. As the incident took place in a remote part of the State, 800 miles from a laboratory, some omissions in the investigations were inevitable.

Clinical and Laboratory Findings

The family consisted of a husband and wife, and nine children whose ages ranged from 8 weeks to 14 years. They had lived for 4 months in a galvanised-iron shack originally intended as a garage or store. The previous tenant had used this shack for breaking down old car-batteries as a preliminary to recovering the lead in them. The lead oxide on the spent cells was knocked out and left in a heap. The family spread this over the earth floor to even and harden it. On analysis, the sand from the floor showed 16% lead as lead salts. The dust from the floor was in very fine particulate form, and, on being disturbed, remained floating in the air for a considerable time. Examination of dust from rafters gave 8·5% lead.

The husband and eldest boy spent little time in the shack and showed no indication of undue lead absorption.

Clinical findings in the others were briefly as follows:

Wife (aged 33): Constipation, severe abdominal pain, cramp in legs, blue line on gums, unable to feed baby after 6 weeks. Admitted to hospital for abdominal pains and cramps.

Child 2 (boy aged 11 years): Vague pains in chest, probably no connection with lead-poisoning. No other symptoms.

Child 3 (boy aged 9 years): Gingivitis, recurrent attacks of abdominal pain, cramps, constipation. Had two epileptiform convulsions on admission to hospital and was semi-comatose for $2^1/_2$ hours. Recovered after intramuscular injections of calcium gluconate.

Child 4 (girl aged $7^1/_2$ years): No symptoms.

Child 5 (girl aged $6^1/_2$ years): No symptoms. Slight blue line on gums.

Child 6 (boy aged 4 years): No symptoms.

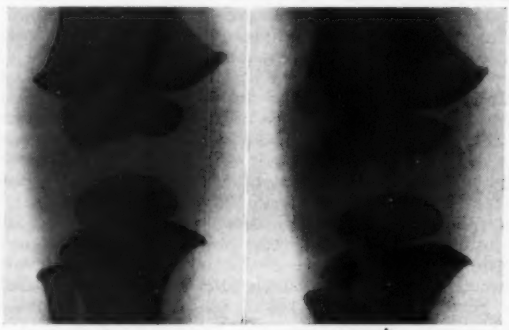
Child 7 (boy aged 4 years): No symptoms.

Child 8 (boy aged 15 months): Malnutrition, underweight, constipation, abdominal cramps or pains. Admitted to hospital because of obvious ill health and abdominal pain.

Child 9 (aged 8 weeks, born 2 months after family started to live in shack, and spent some time in hospital before going home): Underweight, excoriated buttocks, some diarrhœa. Responded quickly to proper diet in hospital.

The mother and children 2–8 were treated with sodium calciumedetate orally, 60 mg. per kg. body-weight daily for 4 days, with marked increase in urinary lead excretion as shown in the table. The three patients with symptoms rapidly recovered but child 8 still showed a few erythrocytes in the urinary deposit 6 months after treatment.

The laboratory findings were abnormal in all cases and indicated lead absorption (see table). (It was not possible to give the excretion over 24 hours, because occasional specimens were missed in the younger children.) The findings varied, however, in severity in each case and (with one exception) did not correspond with the symptoms. No distinct pattern exists, and it is almost impossible from the table to ascertain the relative gravity of the condition in the different patients. The exception is the finding of a few erythrocytes in the urinary deposit of the mother and two of the children. It seems significant that red cells were present in the urine in all three cases in which there were symptoms indicative of lead poisoning, and in no other case. These three cases were all admitted to hospital because of these symptoms, before a diagnosis of lead poisoning was thought of.



a b

Radiographs of knee-joint of child 8: (a) after 4 months' exposure to lead and (b) 2 months later, showing absorption and redeposition of lead at the growing margin.

It seems, therefore, that the presence of red cells in the urine may be an important indication of lead poisoning, and should be looked for in all cases of suspected lead absorption. The gravity of the ultimate prognosis of renal damage in plumbism has been well illustrated by Henderson (1954, 1955) in his review and analysis of plumbism and nephritis in Queensland.

The severity of the lead line in the bones was much more closely associated with the age of the patient and rate of growth of the bones than with the symptomatology.

LABORATORY FINDINGS

Patient	Hæmoglobin (%) (Sahli)	Stippled-cell count (per 1000)	Urinary lead (parts per million)		Lead line on gums	Urinary coproporphyrins (μg. per 100 ml.)	Lead line in bones	Red cells in urine	Relation of severity of symptoms to lead absorption
			Before treatment	During treatment					
Mother	70	24	0·14	1·34	+ +	46	Not radiographed	+	+ +
Child 2	68	2	Not examined	0·81	Nil	29	Not radiographed	Nil	Nil
Child 3	65	18	0·13	0·75	Nil	73	+	+	+ + +
Child 4	76	6	0·38	1·38	Nil	87	Not radiographed	Nil	Nil
Child 5	60	34	0·18	3·87	+	54	+	Nil	Nil
Child 6	60	18	0·15	0·43	Nil	50	+	Nil	Nil
Child 7	66	36	0·16	0·95	Nil	34	+	Nil	Nil
Child 8	80	20	0·11	0·8	Nil	Not done	+ +	+	+ +

The radiographs in the accompanying figure are from child 8 at 15 months and again at 17 months, after treatment with sodium calciumedetate. Lead has been reabsorbed from the original lead line and redeposited at the growing margin. This process of mobilisation and redeposition has been referred to by Vogt (1932).

Summary

Lead absorption and indications of lead poisoning were found in nine members of a family of eleven. Radiographs showed lead lines and absorption and redeposition of lead. Signs of renal damage, such as red cells in the urine, may be an important manifestation of lead poisoning and should be looked for in all cases of suspected lead absorption.

Laboratory findings such as hæmoglobin levels, stippled-cell count, and urinary lead and coproporphyrins, show varying degrees of abnormality in different individuals, and the degree of abnormality is not necessarily consistent with the severity of the symptoms.

Child 9 was investigated, and the initial diagnosis of lead poisoning in the family established, at the Princess Margaret Hospital for Children, Perth, Western Australia, where the radiographs were taken. Chemical analyses were performed at the Government Chemical Laboratories. Coproporphyrin estimations and blood examinations were made by the biochemical and hæmatological departments of the Royal Perth Hospital. I am also indebted to Dr. W. Kowal, district medical officer, for his assistance.

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Preliminary Communication

RESERPINE AND NORADRENALINE IN ARTERY WALLS

As long ago as 1913 Handovsky and Pick [1] observed that nicotine had a peripheral constrictor action in the vessels of the frog. In 1953 Kottegoda,[2] working under the direction of one of us (J. H. B.), studied the constrictor effect of nicotine in the perfused rabbit ear. He found that the constrictor action was converted to a dilator action when 'Priscol', which is an anti-adrenaline substance, was present in the perfusion fluid. This suggested that the constrictor action of nicotine was due to the release of noradrenaline (or adrenaline), and that the constriction was not primarily due to nicotine itself. Kottegoda also found that when the skin was removed from the rabbit's ear, nicotine did not exert a constrictor action when perfused through the vessels still remaining.

We have now found that if rabbits are treated with reserpine on two days preceding the day when the ear is perfused, nicotine no longer exerts a constrictor action. Now reserpine has been shown by Bertler, Carlsson, and Rosengren [3] to remove noradrenaline and adrenaline from rabbit hearts. We therefore wondered if we would find noradrenaline present in the skin of the rabbit's ear, and whether reserpine treatment would cause the disappearance of this noradrenaline. We have in fact found that when an extract is made of the skin of a rabbit's ear, the extract contains a substance which behaves like noradrenaline and which can be estimated by comparison with noradrenaline on the blood-pressure of the pithed rat in the presence of atropine. We found a mean amount of 0·1 μg. per g. in the skin of normal ears. In the ears of rabbits treated with reserpine, the amount was lower, being 0·027 μg. per g., the difference in the means being highly significant.

1. Handovsky, H., Pick, E. P. *Arch. exp. Path. Pharmak.* 1913, **71**, 89.
2. Kottegoda, S. R. *Brit. J. Pharmacol.* 1953, **8**, 156.
3. Bertler, A., Carlsson, A., Rosengren, E. *Naturwissenschaften*, 1956, **43**, 521.

SUBSTANCES PRESENT IN EXTRACTS OF RABBIT AORTA ESTIMATED AS NORADRENALINE μG. PER G.

Control rabbits	Reserpine-treated rabbits
0·53	Less than 0·04
0·73	,, ,, 0·11
0·42	,, ,, 0·14
0·21	,, ,, 0·07
0·71	,, ,, 0·06
Mean 0·52	Less than 0·08

We then wondered if the noradrenaline-like substance was present in the walls of the arteries, and therefore we examined the aortæ of normal rabbits and of rabbits treated with reserpine. Schmiterlöw [4] has shown that noradrenaline is present in the arteries of various species. Our results are shown in the accompanying table. They indicate that noradrenaline is present in rabbit aortæ, and that the amounts are greatly reduced after treatment with reserpine.

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4. Schmiterlöw, C. G. *Acta. physiol. scand.* 1948, **16**, suppl. 56.

Reviews of Books

Uses of Epidemiology

J. N. MORRIS, M.D., F.R.C.P., D.P.H., director, M.R.C. social-medicine research unit, The London Hospital. Edinburgh and London: E. & S. Livingstone. 1957. Pp. 135. 17*s.* 6*d.*

THIS book confirms the wisdom of the war-time decision to encourage social-medicine research in this country; at the same time, it shows how near the lunatic fringe of meaning the term "social medicine" has since been driven. Dr. Morris tells us that he is writing about investigations which take as their unit of study "the population or group, not the individual"; the book is in fact all about the uses of social medicine. But he is so determined not to have his subject confused with the hotch-potch of socio-medical activity of the post-war years that the book's connection with the subject is never once admitted. The dilemma is real, but to resolve it in this way is tantamount to saying that a branch of medical science should be renamed and that all attempts to characterise the unhealthy or healthy features of selected populations, including purely anthropometric surveys, should be classified as epidemiology—a word which once meant the study of diseases that characteristically wax and wane.

The pretence that the book has nothing to do with social medicine does nothing, of course, to hide the fact that it is a unique and valuable contribution to the medical student's library. It is the first of its kind, and sets three subjects—public health, clinical medicine, and social medicine—in their correct perspective.

Dr. Morris's obvious enthusiasm for his subject is conveyed to the reader, though the inclusion of actual examples, hypothetical examples, tentative suggestions, and other odd thoughts between a series of commas and brackets is sometimes exhausting. But the general framework of the book is so strong that it could be used to give a much more comprehensive account of the medical problems that have been tackled by population studies. It is to be hoped that such a book (and a companion volume on survey methods) will one day be written. Meanwhile the need for a short lively textbook on the medical uses of population studies was so great and has been so well met that we hesitate to suggest that one chapter has been omitted. Is it, however, fair to say that the book will deal with studies of health and disease, and then to say no more about health than "the boundaries of 'health' and 'disease' are philosophical problems that will be largely avoided in the following pages"? There are, after all, many studies, particularly of general and skeletal growth, which have used social-

medicine (epidemiological) techniques both to detect influences which affect development without causing overt illness, and also to establish useful norms. Nor need clinical students be told how relevant such standards are to modern precision medicine.

One especially interesting feature of the book is a long table designed to show that clinical, laboratory, and population studies are complementary. Dr. Morris deals in turn with twenty-four problems, which have been systematically studied by clinicians, pathologists, and epidemiologists. The main findings under these three headings are listed in separate columns, and where there has been a definite sequence of events this is indicated. As might be expected, clinical observations were usually the point of departure in the older investigations, but increasingly in recent years the stimulus to laboratory research has come from a population study. Dr. Morris is to be congratulated on showing the importance of population studies to medicine in general—one way in which the traditional field of public health is being enlarged.

Sidelights on the History of Medicine

Editor: SIR ZACHARY COPE. London: Butterworth. 1957. Pp. 246. 45*s*. (37*s*. post free to fellows of the Royal Society of Medicine.)

THE council of the Royal Society of Medicine thought that the society's jubilee would be a good occasion to look back at some landmarks of the past; and they decided to do so by publishing a selection of papers that had been presented to the society's section of the history of medicine during the past forty years. They made the best possible start in this venture by securing Sir Zachary Cope to edit it.

The 23 papers chosen range widely. There are biographical studies of Paracelsus, Van Helmont, Lower, Physick, Hooke, Robert Knox, and Withering. Other papers are concerned with Greek medical etiquette, the medical aspects of the medieval monastery in England, the medical staff of King Edward III, and histories of the parturient chair and of the Royal College of Physicians. Many well-known authors, living and dead, have contributed to this entertaining miscellany.

Les meningiomes

J. GUILLAUME, R. BILLET, J-P. CARON, D. CUCCIA. Paris: Presses Universitaires de France. 1957. Pp. 173. 2700 Fr.

Dr. Guillaume and his colleagues have written a brief but fairly complete review of the symptomatology, diagnosis, and treatment of meningiomas. They include a discussion of adjuvant methods of diagnosis: encephalography, including tomography; angiography; and electroencephalography. They discuss complications and results in their own and other recorded cases. Their high overall mortality dropped only when modern methods of anæsthesia came into use—an interesting comment on technical advance and teamwork in medicine.

Steroid Homeostasis, Hypophysis, and Tumorigenesis

Prof. ALEXANDER LIPSCHUTZ, M.D., director, institute of experimental medicine, National Health Service, Santiago, Chile. Cambridge: Heffer. 1957. Pp. 92. 15*s*.

THIS volume brings up to date Dr. Lipschutz's *Steroid Hormones and Tumours*, published in 1950.[1] An extensive bibliography includes references up to 1956. Experimental work from the author's own school and elsewhere is examined in a spirit of inquiry that seeks to unravel the complexities and conflicting results continually emerging in this branch of cancer research.

As Dr. Lipschutz points out, to say that certain tumours can be induced by altering steroid homœostasis—the normal balance—does not tell us how in fact they arise spontaneously. Even in experiments, the same results do not always follow the same changes in hormone relationships in all animals or in different breeds of the same one. A tentative suggestion is made in one such instance (and it might well apply in others) that the explanation may lie in precise quantitative relationships and in a consideration of timing of disturbed hormonal balances.

1. See *Lancet*, 1951, i, 1000.

Dr. Lipschutz discusses critically the part played by hypophyseal hormones, the status of some tumours caused by and subject to hormonal influences, the possible influence of external stimuli affecting the nervous system, and the application of what is now known as "attempted anti-cancer therapy." All interested in cancer research will welcome so useful a summary.

Clinical Aspects of Arteriosclerosis

SEYMOUR H. RINZLER, M.D., F.A.C.P., associate physician, Beth Israel Hospital, New York. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957. Pp. 339. 66*s*.

IN his extensive synthesis of information about arteriosclerosis, Dr. Rinzler starts with general considerations, statistics, and discussions on ætiology and biochemistry. There follow clinical accounts of arteriosclerosis as it affects the heart and the cerebral and peripheral vessels. The book is extensively illustrated and contains a full bibliography. The main criticism is that it is too complete: without harm, old and dead wood could be pruned so as to reduce its size by half. For example, in the treatment of angina pectoris a great many remedies are considered at some length only to be discarded as valueless; and some may doubt the need for plates from Gray's Anatomy showing the arterial supply to the orbit and the lower limb.

Calcium Metabolism

J. T. IRVING, M.D., professor of experimental odontology, University of the Witwatersrand, Johannesburg. London: Methuen. New York: John Wiley. 1957. Pp. 178. 11*s*. 6*d*.

IN this very useful review of the subject, which puts emphasis on the dietary requirement and utilisation of calcium, a surprising amount of information and a large number of indispensable references have been provided in a small pocket-book. It is extremely readable and is occasionally enlivened by glimpses of the author's own strong views on controversial points.

Comparative Aspects of Hæmolytic Disease of the Newborn

G. FULTON ROBERTS, M.D., lecturer in pathology, University of Cambridge. London: Heinemann Medical Books. 1957. Pp. 199. 17*s*. 6*d*.

THE original parts of this interesting book are the historical account, which attributes the first full description of the disease to Sylvius in 1679, and the sections on the disease in domestic animals. It is found in horses and mules, as well as in pigs, but in pigs it seems that the use of "crystal-violets wine-fever vaccine," prepared from pooled pigs' blood, may be responsible. The experimental production of the syndrome in guineapigs, rats, rabbits, and dogs and the treatment and control of the disease are also described (it must be exciting to give an exchange transfusion to a valuable foal). The chapters on the human disease are short but adequate and well documented.

Chemical Methods in Clinical Medicine (4th ed. London: J. & A. Churchill. 1957. Pp. 667. 65*s*.)—The new edition of Dr. G. A. Harrison's book has been eagerly awaited, and the 1957 text makes it one of the leading books on clinical chemical pathology. There are again twenty-eight chapters, covering the subject completely. Some will question Dr. Harrison's wisdom in omitting any reference to urinary 17-ketosteroids; and he has also excluded the Robinson, Power, and Kepler test (because he found it positive only when Addison's disease was obvious clinically or by examination of the blood-electrolytes), and all except the zinc-sulphate test of the precipitation tests of liver function. These and other decisions may cause comment, but he gives reasons for them all. The discussion on electrophoresis is particularly clear. The section on basal metabolism, however, is often hard to follow, and in future editions the inaccurate Sanborn standards, condemned in this country as well as in America, might well be abandoned in favour of the Aub and du Bois method, using surface area multiplied by a factor for age and sex. The diagrams, both coloured and black-and-white, are excellent. The book is well printed, well edited, easily readable, and a "must" in every laboratory of chemical pathology.

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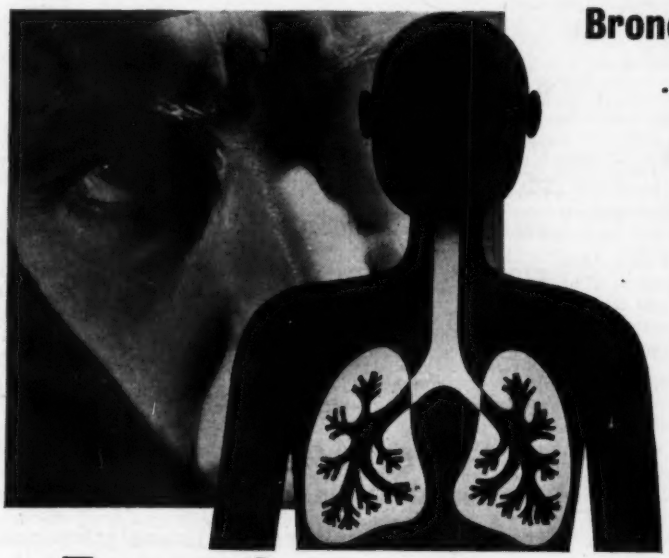

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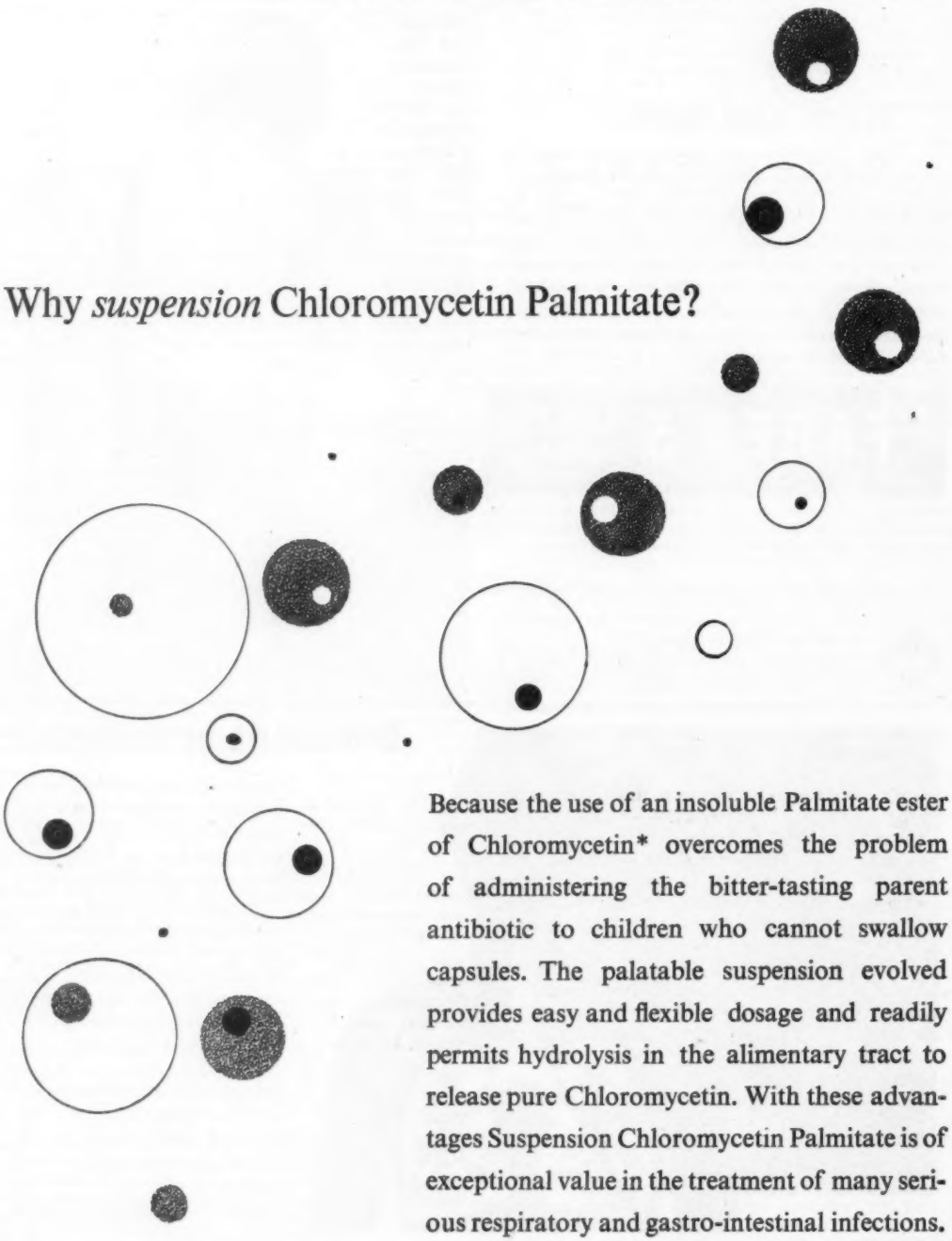

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THE LANCET

LONDON: SATURDAY, NOVEMBER 30, 1957

A Functional Necessity

A FEW months ago [1] we explained again why we think that a new grade—that of specialist—should be created for those who have completed their training in a specialty but have not yet been appointed consultants. This grade, which would absorb both time-expired senior registrars and senior hospital medical officers, would be the normal stepping-stone to consultant status; but its salary range—overlapping that of consultant—would be wide enough to provide properly for those who go no further. Unfortunately, this (as we believe) functionally correct solution of present and impending difficulties is resisted by the bodies which speak jointly for consultants. In opposing it in our columns Dr. ROWLAND HILL,[2] deputy chairman of the Central Consultants and Specialists Committee of the British Medical Association, wrote:

"All staff employed to assist the permanent staff of physicians and surgeons should be composed of competitively selected youthful holders of various posts who are either going up competitively to consultant rank or out of the hospital service before too many years have gone by."

Dr. HILL later qualified this assertion. "No-one," he said,[3] "disputes that there is a place for a career grade lower than consultant in certain narrow and routine hospital work outside the main clinical streams—e.g., medical custodial work in chronic psychiatric institutions." But he and those who think with him are still unwilling to recognise such a rank as assistant physician or assistant surgeon.

A hospital service can, of course, be staffed satisfactorily by consultants and trainees—but only if two conditions are fulfilled. The first is that enough doctors are in training to do all the medical work that consultants do not need to do; the second, that those who go through their training creditably can be sure of employment in the specialty for which they have trained. Today neither of these conditions is met. This is most evident at the peripheral hospitals, which are short of junior medical staff, and notably of registrars and senior registrars. The main cause of the shortage is that young doctors see that the trainee/consultant ratio is too high, and have now been convinced that those who train only at non-teaching hospitals very seldom gain a consultant post. An effect of the shortage is that some consultants are already having to take on registrars' work—to the disadvantage of their departments. Whereas twenty years ago many ward units could be run more or less satisfactorily by a consultant and his houseman, there is nowadays an inescapable need for someone at an intermediate level. Indeed this fact was plainly stated by the Central Consultants and Specialists' Committee's subcommittee on hospital medical staffing (chairman Prof. G. I. STRACHAN) when it reported [4]:

"In a hospital much of the clinical work is too responsible for house officers, but often does not require the personal services of a consultant, provided it is carried out under his supervision."

If we can no longer count on trainees, who is to do this work? At present, there is little hope of attracting to it future general practitioners, except perhaps in a few subjects (medicine, obstetrics, pædiatrics) for fairly short periods; for, regrettably, the fences between different kinds of training have been allowed to rise so high that the would-be general practitioner often finds that hospital experience beyond the most junior posts is a positive handicap. Nor would a mere increase in the number of consultants be a sound way of closing the whole widening gap left by the unfilled registrar posts in peripheral hospitals. Though it is true that some registrars have been doing consultant work, for which additional consultants ought to be appointed without further delay, there is no case—even if times were better—for appointing new consultants to undertake the less difficult work which has rightly been given to young men in training. Joint registrar appointments between teaching and non-teaching hospitals will help to spread the effects of the shortage but cannot do much to lessen it. In our opinion the hospital service cannot much longer be operated fully by the triad of teachers (consultants), trainees (registrars), and transients (house-officers). The Strachan report said squarely [4]:

"The Subcommittee considers that the policy of specifying a certain category of medical staff for the training of consultants, and of fixing hospital establishments wholly in relation to prospective consultant vacancies, is wrong, and should be abolished. The hospital medical establishment should depend upon the type and amount of medical work (including research and teaching) required to be done in the hospital and should be determined in consultation between hospital boards and their consultant staffs."

And later:

"It is essential that in the future the partial restoration of an old principle should be sought: that is, that at all levels in the hospital, from house officer to consultant, appointment to a post should be for the purpose of carrying out the work of the hospital at that level."

The subcommittee found that "there is still a need for an intermediate grade of hospital officer who shall bear responsibilities consistent with the performance of much of the regular medical, surgical, and other treatment which makes up the work of the hospital, while he is preparing for a consultant post." Most who remained in the hospital service long enough would achieve consultant status; but those who did not do so would be retained indefinitely.

It should be noted that the Central Consultants and Specialists Committee agreed that this report should be submitted to the Joint Negotiating Committee, and assented to its being used in discussions with the Ministry of Health.[5] But subsequently the committee have had second thoughts,[6] and have declared themselves [7] against the proposed new grade. In thus turning away from the Strachan report they seem to us to have repudiated the important principle that medical staffing should be shaped, with safeguards, to the needs of hospitals, and instead they have taken up a defensive posture which seems to be conditioned little, if at all, by the hospitals' needs. This defensiveness is implicit in such statements as: "No new subservient grade should be introduced to relieve the younger consultant of the work he should do" and

1. *Lancet*, 1957, i, 1127, 1133.
2. Hill, T. R. *ibid.* Aug. 10, 1957, p. 291.
3. *ibid.* Sept. 7, 1957, p. 486.
4. *Brit. med. J.* suppl. 1955, i, 177.
5. See *ibid.* suppl. p. 51.
6. See Brooke, B. N. *Lancet*, Sept. 21, 1957, p. 595.
7. Sellors, T. H., Strachan, G. I. *ibid.* July 13, 1957, p. 92.

"A stooge grade of subconsultant is totally unnecessary." [2] But surely "stooges" already abound because of the defects of the staff structure that now prevails. For years after completing their training many senior registrars do important work with no proper status, salary, or security; and in the end some may have to leave the hospital service altogether. In the words of Mr. MICHAELIS [8]: "The gap in pay, security, and prestige between the successful applicant for a consultant post and his fifty or more equally well-qualified fellows who fail is much too wide." But even those who in the end gain a consultant post may first have a needlessly uncomfortable time: it is monstrous that doctors should commonly have to wait until the age of 40 or over before learning that they may continue the work of their choice. Appointment at an earlier age to an intermediate grade would provide the security to which both future consultants and others are entitled.

Another group who may smile wryly at the suggestion that we should not have a new grade lest some be made "stooges" are the senior hospital medical officers. Through loyalty to the concept of hospitals staffed by consultants and trainees, there has arisen a tendency either to ignore or to decry this incompatible group. "It should not be possible for persons of only mediocre attainments to stay permanently in the hospital service simply because they would like to do so." [2] Yet, as Dr. WHITTAKER [9] points out, some departments could hardly carry on without the help of such people; and their value becomes clearer as registrars become fewer. Here again, the Strachan report was explicit:

> "there will still remain a small number who fail to reach consultant rank yet who prefer hospital practice, and who, because of their training and experience, have a valuable contribution to make to the work of the hospital. It is essential that provision should be made for this small number of practitioners to make a permanent career in the hospital service."

In the negotiations on hospital staffs fresh thinking is needed. If the profession is going to guide developments, and not be dragged along in their train, it must seek a fresh starting-point; and to go forward it may first have to go back to the principles so clearly stated in the Strachan report.

Intracranial Aneurysms

ONE of the main reasons for the present confusion regarding the treatment of intracranial aneurysms is the difficulty in comparing one worker's observations and results with those of another. In recent years direct surgical exposure of the aneurysm has been repeatedly advocated; but it is not immediately obvious what the results of such a policy should be compared with. Every new advance seems to bring forth its little crop of papers which imply that the achievements of predecessors in the field have fallen short of a reasonable minimum. Accordingly, suspicions are aroused that earlier enthusiasts were misled by inadvertent selection of cases. It is almost impossible for any single worker to say that his own cases are unselected, for their nature may be influenced by the density of the surrounding population, the ease with which emergencies of poor prognosis are admitted to his hospital, and the general consensus of opinion held by medical practitioners in his neighbourhood. MAGLADERY [1] has reviewed large series which indicate that the initial mortality-rate from a first hæmorrhage lies between 35% and 50% [2-6]; and he has himself described over 200 cases treated, usually without operation, at the Johns Hopkins Hospital in 1947–54, during which time the methods of investigation remained fairly constant.

Of the patients treated conservatively 30% died within the first twenty-four hours, another 6% in the remainder of the first week, and a further 7% after the end of the first week. In 10% of the patients hæmorrhage recurred after the end of the first week, and half of these died; nearly all the recurrences took place within three weeks after the onset of the initial bleeding. (In the first week angiography showed the cause of the hæmorrhage in only about 1 in 3 of MAGLADERY's cases; thereafter angiography was positive in about half the cases. This investigation itself was believed to have contributed to a fatal outcome in about 5% of the patients.) HYLAND [7] found that, once the original illness is over and the patient has left hospital, the recurrence-rate is 20% with again a mortality-rate of 35–50%. In patients who have recovered satisfactorily in six weeks, any form of treatment must achieve a final mortality lower than 7–10% to improve on the natural history of the disease. Old age and hypertension both carry a very poor prognosis, and subdivision to allow for these factors introduces further complexities. [8 9] Physical and mental disability must also be taken into account in deciding treatment. If agreement could be reached even on mortality figures alone, a considerable advance would have been made.

Two types of operation have long been advocated: occlusion of the main vessels leading to the aneurysm; and direct attack on the site of the aneurysm, together with some measure to render hæmorrhage less likely. In proximal ligature, usually of a carotid artery in the neck, the aim has been to reduce pulsatile pressure in the aneurysm without dangerous reduction of blood-flow to the brain. In 1905 HALSTED [10] was applying an aluminium band to the common carotid artery, occluding it partially with the intention of obtaining "by gradual occlusion a secondary development of the circulation in parts liable to suffer from insufficient vascular supply." DANDY [11] emphasised the necessity of assessing the collateral circulation before proximal ligation; if it was inadequate he advised partial occlusion of the carotid, to be followed later by total ligation. He laid down criteria for safety in the form of trial compression and ligation; but intractable paralysis and aphasia occasionally developed up to seventy-two hours after ligation, even when DANDY's precautions had been adopted. It was claimed that an accurate record of pressure in the internal carotid artery in the neck gave a useful indication

8. Michaelis, L. S. *ibid.* July 27, 1957, p. 187.
9. Whittaker, S. *ibid.* Aug. 17, 1957, p. 339.

1. Magladery, J. W. *J. Neurosurg.* 1955, **12**, 437.
2. Jacobson, S. A. *Arch. Neurol. Psychiat.* 1954, **72**, 712.
3. Magee, C. G. *Lancet*, 1943, ii, 497.
4. Wolff, G. A., Goodell, H., Wolff, H. G. *J. Amer. med. Ass.* 1945, **129**, 715.
5. Walton, J. N. *Brit. med. J.* 1952, ii, 802.
6. Walsh, L. S. Modern Trends in Neurology; 2nd Series, p. 119. London, 1957.
7. Hyland, H. H. *Arch. Neurol. Psychiat.* 1950, **63**, 61.
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9. Hamby, W. B. *J. Amer. med. Ass.* 1948, **136**, 522.
10. Halsted, W. *Johns Hopk. Hosp. Bull.* 1905, **16**, 346.
11. Dandy, W. E. Intracranial Arterial Aneurysms: p. 92. New York, 1944.

of the pressure in the main cortical arterial vessels,[12-17] and that a fall of 50% in the systolic pressure would not be followed by symptoms due to ischæmia of the brain.[18 19] But it is now thought that the level necessary to prevent ischæmia is higher than was suggested, and probably not more than a 25% drop is safe.

Direct attack on the intracranial aneurysm itself or on the vessels bearing it has been practicable only since the introduction of cerebral angiography.[20] The method of attack—packing with muscle, clipping or ligation of the neck of the sac, isolation of the segment of the vessel with clips, proximal occlusion,[21] or repair of the parent vessel—has been much debated, as have been the indications for surgical intervention at various times after the original hæmorrhage.[22-25] Many neurologists are unconvinced that surgical intervention improves the outcome; CALVERT [26] concluded that wrapping the sac of the aneurysm with muscle or muslin net might have a low operative mortality-rate and help to prevent recurrent bleeding. He did not think that carotid occlusion could be attempted safely any earlier after an acute episode than could direct exposure; but he believed that further investigation of the changes in arterial pressure after carotid occlusion might result in the emergence of earlier and safer surgical intervention. DUTTON [27] recommended surrounding the aneurysm with self-setting acrylic resin, and claimed that the resulting firm coating was not harmful to cerebral blood-vessels, though the presence of a free monomer occasionally gives trouble in other situations. GIBBS [28] recommended that certain aneurysms should be temporarily isolated by clamps, then opened and ligated in a slack state or left with an appropriate clip across the main vessels.

One of the important advances in dealing with aneurysms has been hypothermia, which allows long occlusion of the arteries during the operation.[29 30] BOTTERELL et al.[31] have located the site of hæmorrhage by temporary occlusion of all the main cervical arteries, following this by clipping or ligating the neck of the aneurysm. They secured thus eight minutes of working time. They considered this complete compression of both carotid and both vertebral arteries advisable in 11 out of 22 patients. This proportion is very high; but the judicious use of small clamps applied intracranially to adjacent vessels [28] might often be equally efficacious. BOTTERELL suggests that, with hypothermia, early operation has become safe enough to be undertaken in a high proportion of cases; but of his 12 patients operated on within two weeks of hæmorrhage 3 died and 2 had bad functional results. These totals are still small, but so far they compare with those in untreated cases. Meanwhile it seems best to act on the lines suggested by CALVERT, undertaking progressive proximal occlusion in the reasonably early stages, and following this, in some cases where the anastomotic circulation has been proved safe, by direct surgical intervention.

Postoperative Venous Thrombosis

DESPITE advance in prophylactic routine, it is extremely doubtful whether the incidence of postoperative venous thrombosis is diminishing; and, because its detection requires great alertness from the resident hospital staff, the highest figures are reported from the best units. Deep-vein thrombosis nearly always pursues an uncomplicated and self-limited course; but, with the steady decline in operative mortality from other causes, the few cases which give rise to pulmonary emboli now account for most "inevitable" deaths after "bread-and-butter" pelvic and abdominal operations.

Postmortem series vary widely in their material, in the extent of venous dissection (the veins of the lower limbs are not usually dissected), and in the pathologist's interpretation. That leg-vein thrombosis is extremely common in any unselected necropsy series is beyond dispute. RÖSSLE [1] found thrombi in the calf veins at necropsy in 88 of 324 subjects over twenty years of age. He discovered evidence of concomitant femoral-vein thrombosis in 38; but there were only 7 cases of thrombosis of femoral or hypogastric veins without thrombosed calf veins. HUNTER et al.[2] found thrombosis of leg veins in 53% of 351 middle-aged and older subjects who had been confined to bed. There are excellent grounds for believing that these common leg thromboses are the springheads of most pulmonary emboli.[2-6] From their careful teleradiological and postmortem studies HAMPTON and CASTLEMAN [3] concluded that "a very large percentage of [pulmonary] emboli arise from symptomless thromboses of the deep veins of the leg; and, after carefully reviewing other reputable series,[7-11] CRANE [12] endorses this thesis. (He regards an "all-round figure of 85% for leg-vein origin of fatal pulmonary embolism reasonable: this might be 90% in surgical and 80% in medical cases.") Others, on the other hand, maintain that most so-called pulmonary emboli are, in fact, primary pulmonary thromboses.[13 14] Of 100 cases of massive pulmonary embolism CRANE [12] found that the clinical records contained no reference to the legs in 51; and that in another 15 examination for leg-vein thrombosis was negative or equivocal. The warning

12. Sweet, W. H., Bennett, H. S. *J. Neurosurg.* 1948, **5**, 178.
13. Sweet, W. H., Sarnoff, S. J., Bakay, L. *Surg. Gynec. Obstet.* 1950, **90**, 327.
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22. Falconer, M. A. *J. Neurol. Psychiat.* 1951, **14**, 153.
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25. Poppen, J. L. *ibid.* 1951, **8**, 75.
26. Calvert, C. A. *J. Neurol. Psychiat.* 1957, **20**, 159.
27. Dutton, J. G. M. *Brit. med. J.* 1956, ii, 585.
28. Gibbs, J. R. *J. Neurol. Psychiat.* 1957, **20**, 185.
29. Lougheed, W. M., Sweet, W. H., White, J. C., Brewster, W. R. *J. Neurosurg.* 1955, **12**, 240.
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31. Botterell, E. H., Lougheed, W. M., Scott, J. W., Vandewater, S.L. *ibid.* 1956, **13**, 1.

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3. Hampton, A. O., Castleman, B. *Amer. J. Roentgenol.* 1940, **43**, 305.
4. Short, D. S. *Brit. med. J.* 1952, i, 790.
5. Ravdin, I. S., Kirby, C. K. *Surgery*, 1951, **29**, 334.
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7. Byrne, J. J., O'Neil, E. E. *Amer. J. Surg.* 1952, **83**, 47.
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13. Cummine, H., Lyons, R. N. *Brit. J. Surg.* 1948, **35**, 337.
14. Dew, H. *Ann. R. Coll. Surg. Engl.* 1953, **13**, 1.

signal of an impending major infarction were positive leg signs in 23, earlier minor emboli in 12, and both in 11. These figures reflect greater awareness of thromboembolism than do those in most series.[11 15–18] It is against this uncertain background that the clinician must choose between anticoagulant therapy and venous division with or without anticoagulants.

A seven-to-ten day course of heparin (or one of the longer-acting anticoagulants) has obvious advantages over vein division. It should lessen rather than aggravate the venous block in the affected leg; it should diminish the chances of clotting and clot-propagation in the pelvic veins and the right side of the heart (which cannot be protected surgically); it should impede the growth of thrombi already lodged in the pulmonary circulation; and it does not require an operation. On the other hand, anticoagulants afford protection only so long as they are administered; and they are contraindicated in patients with bleeding lesions, blood dyscrasias, severe liver damage, after recent operation on the brain or spinal cord, or when large raw areas have been left behind at operation. Moreover, they may have other adverse effects not fully explored; in some laboratory animals, for example, they retard the union of fractures.[19] The first forty-eight hours after operation is the critical time for bleeding. The blood of many postoperative patients shows excessive fibrinolytic activity; and this leads to the dissolution of primary clots. Secondary clots are rapidly formed; but, under the influence of heparin, they may be too tenuous to seal off blood-vessels effectively.[20 21] The reluctance of most surgeons to adopt anticoagulant treatment as a postoperative routine is thus well justified, though its prophylactic value cannot be doubted.[22 23] In any large and unselected series it would be unsafe to expect treatment-failures to amount to less than 10% of the total and the mortality under treatment to less than 1%.[24–27] Depot-heparin has many drawbacks and few advantages, compared with soluble heparin or the anticoagulants of the coumarin and indanedione group.[28 29]

CRANE [12] has made an unbiased survey of 417 surgical and 65 medical patients, treated for thromboembolism in Boston over a six-year period.

The 417 surgical patients included 51 who had presented with thromboembolic disease as their chief complaint and 75 who had cancer; 25 had undergone cardiac surgery; and 266 were drawn from the general surgical, urological, orthopædic, neurosurgical, and other specialist services. The medical group consisted only of those patients who had been seen by the surgeon in consultation with the physician in charge; it included 48 cases of cardiac disease. In the whole series 391 patients were treated with anticoagulants; 126 patients were subjected to venous interruption either as an additional safety measure, as the sole method of treatment, or because anticoagulants had failed.

Of the 391 patients treated with anticoagulants, the first 100 received "depot-heparin," and in 8 of these major hæmorrhage took place. Of the 291 patients who were treated by injections of sodium heparin, 6 had severe hæmorrhage. CRANE remarks that "having the clotting-time return to normal or near-normal levels before the next dose seems to protect patients to a considerable degree against bleeding."

There were 44 cases of "heparin failure"—patients who had recrudescence of thrombosis or embolic episodes either under treatment or within sixty days after its cessation. Poor-risk patients formed the majority of this group.

The prospect of patients in good general health, treated for thromboembolism in the course of a short-term illness or injury, can hardly be improved by venous division. Others, however, need long-term protection: and for them the operation must be seriously considered. Not least because of an excess of initial enthusiasm, vein-ligation has never been thought highly of in Britain; but it is practised in some of the best surgical clinics of the United States [29–32]; and few of those who have given it a fair trial doubt its value.

In 44 of CRANE'S patients venous division was undertaken because anticoagulants had failed to control the thrombotic process: in 94 pulmonary embolism was an immediate indication. CRANE distinguishes a "cardiac" from a "non-cardiac" group. In the cardiac group "even the best treatment is none too efficacious"; but, because they need long-continued or permanent protection, "femoral-vein division [in this group] is recommended quite freely, heparin therapy often being added for a week or ten days as an additional precaution." The presence of leg signs gives added promise to the operation; but CRANE is in no doubt that "one must advise [it even] without leg signs and without waiting for perfection in the picture of pulmonary embolism. Femoral-vein division under local anæsthesia can be done with very little risk even in the profoundly ill; the prophylactic feature of the operation here is sound; often no other therapy is available; and the benefit may be great."

INGRAHAM,[33] reviewing the postmortem findings in 28 patients who had died of pulmonary embolism, concluded that femoral-vein division might have saved 8. DEHLINGER and RIEMENSCHNEIDER [34] studied 58 cases of immediately fatal massive emboli. They believed that timely femoral-vein division would have averted disaster in 15; that it might have protected 19 (in whom the thrombosis had already reached the external iliac vein); and that "it would almost certainly have been helpful in 25 in whom no peripheral clots were found but in whom the leg veins were not examined." Division of the femoral vein, like administration of anticoagulants, has its complications. 3 of CRANE'S patients had to undergo a second operation because of hæmorrhage caused by the slipping of a ligature; and less severe bleeding, wound hæmatomas, and lymph fistulas were not uncommon. The prevalence and gravity of late sequels depends mainly on the level at which the ligations are performed. They are commoner and more crippling when the veins are interrupted proximal to the junction of the femoral and profunda femoris veins: but embolism from the deep vein, though rare, is a real possibility.[30 36] Ligation of the inferior vena cava is, of course, the most reliable method of preventing pul-

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36. Baker, D. V., Warren, R., Homans, J., Littman, D. *New Engl. J. Med.* 1950, **242**, 923.

monary embolism from thrombotic foci below the renal veins; but it is a major operation requiring a major anæsthetic, and the late complications can be distressing.[37 38] CRANE advances three rare but clear-cut indications for it: first, pulmonary embolism from ileofemoral thrombosis, after anticoagulants have failed or when they are contraindicated; second, after failure of femoral-vein division supported by anticoagulant therapy; and third, in the treatment of pulmonary embolism from septic pelvic thrombophlebitis. Adequate collateral circulation is usually established by one of several anastomotic pathways.[39]

Comparison between anticoagulant therapy and vein-division is bound to be artificial; and it is apt to be misleading. The two methods give their best results in different types of patients; they can often be usefully combined; and neither provides a final answer. Supplanting older concepts of the "clotting process" (an unfortunate term which suggests a normally dormant mechanism), there is growing appreciation that thromboembolic disorders are disturbances of a delicate enzymatic balance between coagulant and anticoagulant influences. Although some investigators have found that the administration of anticoagulants hastens the recanalisation of thrombi,[40 41] these drugs fall short of the ideal: they are not truly thrombolytic. Enzymatic thrombolysis was suggested by TILLETT and GARNER[42] in 1933; but wide interest in trypsin dates only from the demonstration of its capacity to activate the plasma fibrinolytic system, not only in vitro and when applied topically, but also in the circulation.[43–46] Since non-toxic preparations for intramuscular use became available in 1954, several workers have reported enthusiastically on its value in thrombophlebitis, claiming better results than are obtained with anticoagulants[47 48]; but carefully controlled studies are still lacking. As MOSER[49] wisely points out, it would be a pity if this therapeutic venture fell victim to premature enthusiasm.

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Annotations

TIME AND THE NURSE

How many doctors in hospital give thought to the increasing burden that modern techniques place on their nurses? When therapy was largely expectant a nurse had only to see to a patient's needs, dose him now and then with remedies for symptoms, and, of course, regularly chart his temperature, pulse-rate, and respiration-rate. But with advances in treatment has come complexity of clinical techniques. More drugs are given by injection; oxygen apparatus needs attention; intravenous infusions, especially those containing pressor drugs, may need almost continuous adjustment; accurate measurements of fluid intake and output are more often demanded; frequent recordings of blood-pressure are needed for patients on hypotensive treatment. These, and many similar techniques, have added much to the nurse's work. Charting measurements also takes a good deal of time; and the harassed ward-sister, surrounded by charts, frantically rushing to get them in order in time for the round, is a familiar spectacle to any consultant who unwisely arrives early. The time has come to consider how doctors can relieve the nurses' burden. One obvious way is not to demand clinical measurements unless they are absolutely necessary. It is still usual to record the temperature, pulse-rate, and respiration-rate of every patient at least twice daily. Is this useful today?

Routine temperature readings are helpful in pyrexial illness, but there seems little point in them otherwise. The time wasted by nurses in measuring and setting down the temperatures of patients in hospital only for investigation must amount to thousands of hours a year. Occasionally pyrexia may precede symptoms, and a temperature reading may thus cause an unexpected complication to be suspected sooner; but usually this does not greatly influence the outcome. On the other hand, house-doctors commonly spend time and energy trying to find non-existent disease to account for a physiological "pyrexia."

Our forbears used to lay great stress on the speed and quality of the radial pulse. But the present-day physician seldom notices it at all, except when he is dealing with acute emergencies, heart-disease, or thyroid disturbances. Time spent by nurses in routine pulse-rate recording would be better used in learning proper cardiac auscultation, and in applying it to those patients whose irregularity of rhythm demands it.

Kory[1] has lately shown that respiration-rates routinely recorded by nurses are rarely accurate; moreover they are very seldom needed by clinicians. This is no surprise. The wonder is that the custom of regularly recording the breathing-rate has persisted so long. It should be dropped without further ado.

If hospitals were to make it the rule that temperature, pulse-rate, and respiration-rate were to be recorded only if specifically requested by the clinician, nurses would have more time for more important techniques, and their proper work of nursing the sick.

Much of a ward sister's time is spent on administrative work, such as sorting records and correspondence, filling up forms and certificates, arranging admissions and discharges, and telephoning. Many of these jobs could quite well be carried out by a lay clerk under supervision; and at least one hospital is successfully using part-time clerks to relieve ward sisters of clerical work.[2] An alternative would be to allow nursing cadets to help. Sisters' clerks have little or no contact with actual ward work, and with a little rearrangement of the work a cadet might fill this post without infringing the regulations, which do not allow her to work in the wards. A bright teen-age assistant can be useful to a hard-pressed sister.

THE RISK AFTER RUBELLA IN PREGNANCY

IF a woman gets rubella early in pregnancy and she has heard of Gregg's[3] finding that this may cause malformation in her child, it is natural that she should ask her doctor just how big the risk is. In 1943 Swan and his colleagues[4] in Australia estimated that the risk of malformation was nearly 100% for the children of mothers who got rubella in the first two months of pregnancy, and 50% for those who got it in the third month. This estimate was based on a fallible method of approach. A true estimate

1. Kory, R. C. *J. Amer. med. Ass.* 1957, **165**, 448.
2. See *Lancet*, 1957, i, 941.
3. Gregg, N. M. *Trans. Ophthal. Soc. Aust.* 1941, **3**, 35.
4. Swan, C., Tostevin, A. L., Mayo, H., Black, G. H. B. *Med. J. Aust.* 1943, ii, 201.

of the risk must be based on an unbiased series of mothers catching rubella during pregnancy, followed forward to the children's birth and infancy. In 1946 Fox and Bortin,[5] in the first survey of this kind, in Milwaukee, found only 1 child in 9 malformed where the mother had had rubella in the first trimester. Greenberg and his colleagues [6] in New York have lately summarised eight similar surveys and added a series of 34 births. In their own series 3 of the 34 children were malformed ; 2 of these were twins with cataract and congenital heart-disease, and the other had cataract and microphthalmos. The total score in the collective series for rubella in the first trimester was found to be 15 malformed and 9 stillborn in 120 births. In the first prospective survey in Australia, Pitt [7] found 3 abnormal and 1 possibly abnormal among 14 children.

The best estimate then for the risk of serious and readily detectable malformation after rubella in the first three months of pregnancy is the order of 10–20%. There may well be an additional risk for less readily detectable handicaps, such as minor degrees of mental defect and partial deafness. But the total experience reported is still small ; and the findings of the large-scale survey conducted in this country in 1952 by the Society of Medical Officers of Health and the Ministry of Health should, when they appear, put the estimate of risk on an altogether sounder basis.

A PLAN FOR HOSPITAL ADMINISTRATORS AND CLERKS

Sir Noel Hall's report on the career structure for administrators and clerks in the hospital service has been issued this week.[8] He proposes that, in place of the present system of alphabetical grades extending from A to G, with relatively small differences in the character of the work between one group and the next and certainly very small differences in scales of pay, there should now be a general clerical grade at the most junior level with a supervisory grade as well ; that, above this, there should be three administrative grades (junior, general, and higher), with separate grades, presumably somewhere between the general clerical and administrative, for those with special skills. Those from the clerical grades who have the necessary qualities would be able to obtain promotion to the administrative grades. The junior grade should be a genuine training and probationary post ; and regional boards should exercise some control over the number employed in this grade, which should be strictly related to the probable vacancies higher up. The junior grade will be the point of entry for selected recruits such as university graduates. The existing designated posts should, where possible, be fitted into the proposed new administrative grades. But those posts which carry responsibility beyond the level in the new administrative grades would have three grades of scale (" super-scale " posts), discretion being left to the appointing authority, within certain limits, as to the selection of the appropriate scale and the point of entry to it. The report suggests that the two senior posts under boards of governors and the three senior posts under regional hospital boards should be less precisely defined, and the employers' discretion as to salary should be wider than in the case of management committees.

These proposals are a useful contribution towards unravelling the present tangle in hospital appointments ; but whether they are acceptable will depend on the salary-scales (excluded from the terms of reference of the report), which will have to be agreed. The proposed abolition of the present wholly unsatisfactory pointing system would be a real step forward ; but the suggested new scheme whereby the grading of each group would be determined by negotiation between regional boards and management committees, subject to an appeals tribunal, seems to present some difficulties.

The report describes entirely new promotion procedure, placing immense responsibility on one senior regional-board officer. He would be responsible for compiling and maintaining a register of factual information on all those employed in the region, for carrying out a periodical review to ensure that no-one was overlooked, and for attending appointments committees of management committees, giving them information and advice both on individual candidates and on general matters of selection. The report proposes (for reasons that seem either inadequate or obscure) that for important appointments he should be accompanied by a member of the board. In addition to all this, he would supervise training schemes. After speaking of his relation with employing authorities as that of a " trusted adviser ", the report suggests optimistically that to the hospital staffs he will be " an adviser to whom they can each and all go for advice and who can in suitable cases take the initiative in putting forward their claims for vacant posts ".

The report defines admirably the place and function of the hospital secretary : " He must be the only link with the whole of the Group's administrative machinery through the head of that machinery, the Group Secretary". He must have responsibility comparable in his sphere with that of a general manager, and authority comparable with that of the matron and his senior medical colleague. Sensible proposals follow for relating him more closely with the group and allowing him wider scope. The success of the hospital secretary's job, as it is pictured in the report, depends on an adequate supply of able recruits, intelligent comprehension by employing authorities, and delegation of responsibility by chief officers ; and, of these three requirements, by far the most important is the first.

INFORMATION FOR THE ROYAL COMMISSION

THE British Medical Association and the Joint Consultants Committee have agreed that there can be no objection to doctors answering a questionary about their professional income for the information of the Royal Commission on Doctors' and Dentists' Remuneration. But the joint statement which we print on p. 1115 of this issue shows that the B.M.A. and the Joint Consultants Committee have reservations about the likely value of this approach ; and they have secured from the Royal Commission an assurance that they will have an opportunity of commenting on the figures obtained in this way, from doctors and from members of other professions, before the Commission decide on their recommendations.

In the course of correspondence on this subject the secretary of the Royal Commission wrote :

" The Commission will certainly pay attention to all the factors which were deemed of importance by the Spens' Committees and will hope to receive evidence on these, among other matters, from the profession, but it would be idle for them to shut their eyes to the experience of nine years' actual operation of a publicly organised medical service which was not available to those Committees."

In a letter to Dr. S. Wand, chairman of council of the B.M.A., on Aug. 17, Sir Harry Pilkington, chairman of the Commission, declared that they could not accept as axiomatic that Spens was binding for all time and that its implementation required no more than a reassessment of the cost of living. " We have to survey the field without preconceptions and form our own opinion as to what would be just. We give considerable weight to the requirement made more specifically to Spens than to ourselves to pay regard to the need to maintain the proper social and economic status of the medical profession and to Spens' own concern that regard should be had to increases in the remuneration of other professions ; we consider it essential to inform ourselves as to how far these requirements have in fact been met."

5. Fox, M. J., Bortin, M. M. *J. Amer. med. Ass.* 1946, **130**, 568.
6. Greenberg M., Pellitteri, O. Barton, J. *ibid.* 1957, **165**, 675.
7. Pitt, D. B. *Med. J. Aust.* 1957, i, 233.
8. Ministry of Health : Report on the Grading Structure of Administrative and Clerical Staff in the Hospital Service. H.M. Stationery Office. Pp. 49. 2*s*. 6*d*.

Special Articles

THE POPULATION SERVED BY A HOSPITAL GROUP

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As a measuring-rod for planning, as well as for hospital morbidity studies, there is need for an accurate assessment of the population served by a hospital or hospitals. The only reported survey of this kind was that made in 1951 by the Nuffield Provincial Hospitals Trust (1955) for hospitals in Northampton and Norwich. The results of this inquiry indicated that 2 acute beds per 1000 of the population would meet demands at 85% occupancy, the term "acute" covering the specialties of medicine, surgery, gynæcology, obstetrics, pædiatrics, ear, nose, and throat surgery, ophthalmology, radiotherapy, traumatic and orthopædic surgery, and dermatology. The sample was too small, however, to enable separate population estimates to be prepared for each specialty. The present survey of the population served by a group of hospitals under the Oxford Regional Hospital Board was undertaken with a view to (*a*) testing whether the estimate of the Nuffield Trust was still valid, (*b*) estimating the ratio of beds to population for the main acute departments, and (*c*) ascertaining the size and location of the population served by the group.

Material and Method

The hospitals chosen for investigation were those situated within the boundary of the county borough of Reading, because it was one of the largest group of hospitals under the regional board and most nearly comparable with hospitals surveyed by the Nuffield Trust. Those concerned were the Royal Berkshire, Prospect Park, and Battle hospitals and Dellwood Maternity Hospital (table I). Under the Ministry's definition, the Royal Berkshire Hospital is classified as "acute," Prospect Park Hospital as "mainly acute," and Battle Hospital as "general." The four hospitals are here jointly referred to as "the Reading hospitals."

The procedure used for surveying a hospital population has been described in the report of the Nuffield Provincial Hospitals Trust (1955) and by Bailey (1954, 1956).

The hospital admissions in each local-authority area surrounding the specific hospital (or group of hospitals) are recorded. This involves analysing the admissions to the hospitals surveyed in conjunction with admissions to neighbouring hospitals.

From this information, one can calculate the ratio of the number of admissions in the hospitals under investigation to the total number of admissions in each administrative area.

TABLE I—ALLOCATED BEDS IN THE ACUTE SPECIALTIES OF THE READING HOSPITALS

Specialty	No. of beds in each hospital				Total beds
	Royal Berkshire	Prospect Park	Battle	Dellwood Maternity	
General medicine	59	41	..	..	100
General surgery	94	..	..	..	94
Gynæcology and obstetrics	56	..	48	17	121
Ear, nose, and throat surgery	40	..	..	..	40
Traumatic and orthopædic surgery	..	..	60	..	60
Pædiatrics	38	..	..	..	38
Ophthalmology	19	..	..	..	19
Dentistry	4	..	..	..	4
All acute specialties	310	41	108	17	476

This proportion, applied to the population of the administrative area, gives the population of that area served by the hospitals surveyed.

The aggregate of the various administrative areas is the total hospital population. Expressed as a simple proportion, if the population of a given area is n, and there are x hospital admissions in the area, of which y are admitted to hospital or hospitals surveyed, then the population of that area served by the survey hospital or hospital group is ny/x, and the total population served is the aggregate of the individual areas.

The only difference in design between this survey and that of the Nuffield team was that the period of observation was two calendar months instead of twenty-one days. As a result, relatively greater numbers could be analysed.

From the start, it was necessary to define an arbitrary area from which it seemed likely that all the admissions to the Reading hospitals arose (fig. 1). The net was thrown as wide as seemed reasonable. A few patients

Fig. 1—Map of survey area showing local-authority boundaries.

Key to local-authority areas	Population at June 30, 1955	All acute specialties: Hospital admission-rate (per 1000 population per year)	All acute specialties: Percentage admitted to Reading hospitals
1. Reading C.B.	118,100	65·3	84·6
2. Abingdon M.B.	12,140	118·0	0·8
3. Abingdon R.D.	25,390	41·0	0
4. Aldershot M.B.	40,190	41·3	0
5. Basingstoke M.B.	19,610	100·4	1·5
6. Basingstoke R.D.	17,340	61·7	19·1
7. Bradfield R.D.	22,250	65·7	76·2
8. Bullingdon R.D.	38,770	24·6	1·3
9. Cookham R.D.	15,090	43·3	6·4
10. Easthamstead R.D.	30,230	56·0	29·8
11. Farnborough U.D.	28,260	50·4	0
12. Fleet U.D.	9560	69·7	2·7
13. Hartley Wintney R.D.	25,220	43·3	34·1
14. Henley-on-Thames M.B.	8010	110·1	43·5
15. Henley R.D.	20,450	54·6	60·2
16. High Wycombe M.B.	42,800	82·1	0·3
17. High Wycombe R.D.	42,910	51·7	1·9
18. Hungerford R.D.	9860	65·7	14·8
19. Kingsclere and Whitchurch R.D.	19,180	50·4	31·7
20. Maidenhead M.B.	28,600	86·2	0·3
21. Marlborough M.B.	5430	98·3	0
22. Marlborough and Ramsbury R.D.	10,330	73·8	0
23. Marlow U.D.	6710	74·2	3·6
24. Newbury M.B.	18,540	88·0	34·2
25. Newbury R.D.	19,930	54·2	42·8
26. Thame U.D.	3710	113·2	1·5
27. Wallingford M.B.	3740	85·0	26·4
28. Wallingford R.D.	16,610	53·2	10·2
29. Wantage U.D.	5560	106·8	1·0
30. Wantage R.D.	15,030	53·9	17·8
31. Wokingham M.B.	9370	98·6	68·2
32. Wokingham R.D.	41,430	59·4	76·3

attend the Reading hospitals from outside the defined area, while a number from within the area go to hospitals outside those surveyed (notably the London hospitals). But, as will be shown later, the number involved is small and unlikely to affect the results.

Each hospital to which patients from the defined area were likely to be admitted was asked to supply the address, sex, and age, of all patients admitted, and the department to which they were admitted, during the months of April and May, 1956. Hospitals taking part in the survey included those in the North-West and South-West Metropolitan regions, several private nursing-homes, and hospitals under the jurisdiction of the United Oxford Hospitals and the Oxford Regional Hospital Board. Altogether 77 hospitals took part in the inquiry.

The hospital admissions might represent only part of the total demand for hospital beds, some patients being sent to hospitals outside the group. To see whether a hidden or unsatisfied demand existed, an inquiry was sent to all general practitioners in the area, through the secretaries of the local medical committees, in which the following questions were asked :

Do you have any difficulty in obtaining admission for your patients (other than chronic sick, tuberculous, mentally ill, and mental defective) to the Reading group ?

If so, please give the types of cases and, if possible, the approximate number of patients involved over the past year.

Please say whether you sent any of your patients to hospitals other than the Reading group.

If so, what types of patients do you send to hospitals outside the Reading group and to what hospitals ? If possible give the approximate number during the past year.

What is your reason for sending patients to hospitals outside the Reading group ?

Hospital Admission Survey

Altogether there were 8233 hospital admissions in the survey area during the two-month period. Of these, 7594 were admitted to the acute specialties of medicine, surgery, gynæcology, obstetrics, ear, nose, and throat surgery, traumatic and orthopædic surgery, ophthalmology, and dental surgery. The hospital admission-rate for all acute specialties combined, and the percentage admitted by the Reading hospitals in each administrative area, are shown in the legend to the map. The total annual admission-rate ranged from 24 per 1000 of the population in Bullingdon Rural District to 118 per 1000 in the municipal borough of Abingdon. Similar wide

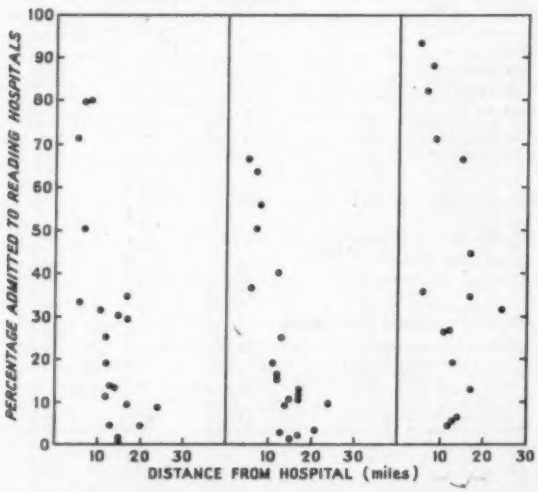

Fig. 2—Scatter diagram of the percentage admitted to Reading hospitals and the approximate distance of the centre of the administrative area from Reading.

TABLE II—HOSPITAL ADMISSIONS AND CORRELATION BETWEEN DISTANCE OF THE CENTRE OF THE ADMINISTRATIVE AREA FROM READING AND PERCENTAGE ADMITTED TO THE READING HOSPITALS

Specialty	Total no. of admissions to all hospitals from survey area during April and May, 1956	Hospital admission-rate per 1000 population	% admitted to Reading hospitals	No. of administrative areas from which patients were admitted to Reading hospitals‡	Correlation (r) between distance from hospital and percentage admitted to Reading hospitals (excluding ReadingC.B.)
Medicine ..	1266	1·73	21·2	21	−0·69 (*0.1%*)*
Surgery ..	1944	2·66	25·1	21	−0·83 (*0·1%*)
Gynæcology	713	0·98	42·4	20	−0·50 (*5%*)
Obstetrics ..	1238	1·69	24·1	17	−0·42 —
Ear, nose, and throat surgery ..	1049	1·44	32·9	17	−0·50 (*5%*)
Traumatic and orthopædic surgery ..	708	0·97	39·7	17	−0·48 (*5%*)
Pædiatrics ..	362	0·50	53·0	15	−0·76 (*1%*)
Ophthalmology ..	222	0·30	50·9	16	−0·63 (*5%*)
Dental ..	92	0·13	69·5	13	−0·42 —
All acute specialties	7594†	10·40	31·2	27	−0·70 (*0·1%*)

* Significant at the level indicated (t test).

† In addition there were 274 geriatric and chronic sick, 93 tuberculosis, and 272 "other" admissions, making a total of 8233 in the survey.

‡ The total number of administrative areas surveyed was 32.

fluctuations were also noticeable between the individual specialties. For instance, the admission-rate varied in general medicine from 3 to 32 per 1000; in general surgery from 6 to 40 per 1000; in gynæcology and obstetrics from 6 to 38 per 1000; in ear, nose, and throat surgery from 1 to 19 per 1000; and in traumatic and orthopædic surgery from 0·2 to 14 per 1000. The reasons for these wide variations are not known and provide scope for further inquiry.

Generally speaking, the percentage of total cases admitted to the Reading hospitals declined with increasing distance from the town, but there were exceptions to this rule (fig. 2) depending on the existence of alternative services. Except in the case of obstetrics, a negative correlation existed between the approximate distance of the centre point of each administrative area from Reading and the percentage of the total hospital cases admitted to the Reading hospitals (table II). So as not to weight the results unduly, patients resident in the county borough have been excluded from this analysis.

The correlation coefficient was significant in each specialty, with the exception of obstetrics and dentistry; it was highly significant in the case of medicine and surgery. This suggests that in most specialties, patients on the whole went to hospitals in their vicinity. The effect of distance on the demand for hospital services is being studied.

The population served by all acute specialties of the Reading hospitals was 228 (± 3) thousand (table III). Of the acute specialties, the smallest population was that of general surgery (178 ± 6 thousand) and the largest that of dentistry (319 ± 11 thousand). The populations for medicine, surgery, and gynæcology, were less than for any of the other acute departments.

The total annual demand for hospital treatment can be taken as the total discharges from the hospital during the year, adjusted for net changes in the waiting-list between the beginning and end of the year. Given this demand and assuming that the average stay will remain unaltered, the number of beds required at different levels of occupancy can be calculated. Since this estimated number of beds is subject to sampling fluctuations, account must be taken of the sample variance. The

TABLE III—ESTIMATED NUMBER OF BEDS NEEDED AT DIFFERENT LEVELS OF OCCUPANCY

Specialty	Beds in Reading hospitals					
	No. available	95% occupancy		90% occupancy		85% occupancy	
		Critical no. with standard error*	Actual no. needed	Critical no. with standard error*	Actual no. needed	Critical no. with standard error*	Actual no. needed
Medicine	99·4	90·7 ± 3·2	98·1	95·8 ± 3·3	103·4	101·4 ± 3·5	109·4
Surgery	94·3	88·4 ± 2·3	94·0	93·3 ± 2·4	99·1	98·8 ± 2·6	105·0
Gynæcology	47·7	36·5 ± 1·4	40·3	38·6 ± 1·4	42·4	40·8 ± 1·5	44·8
Obstetrics	64·4	56·6 ± 1·9	61·4	59·8 ± 2·0	64·8	63·3 ± 2·1	68·5
Ear, nose, and throat surgery	40·1	23·1 ± 0·7	25·5	24·3 ± 0·8	26·9	25·8 ± 0·8	28·4
Traumatic and orthopædic surgery	60·0	52·5 ± 1·9	57·3	55·4 ± 2·0	60·4	58·7 ± 2·1	63·9
Pædiatrics	38·0	32·1 ± 1·3	35·7	33·9 ± 1·3	37·5	35·9 ± 1·4	39·7
Ophthalmology	19·0	16·4 ± 1·1	19·6	17·3 ± 1·1	20·5	18·4 ± 1·2	21·8
Dental	0·3	0·8 ± 0·2	1·2	0·9 ± 0·2	1·3	0·9 ± 0·2	1·3
All acute specialties	463·2	388·9 ± 5·3	400·5	410·6 ± 5·6	422·8	434·7 ± 5·9	447·5

* The critical no. of beds needed is found from total discharges in 1955, adjusted for changes in the waiting-list; the actual or estimated no. needed is derived from the critical no. by adding twice the standard error plus one (or more, according to how much it is wished to reduce the average waiting-time), except in dentistry, where the small no. of beds used did not justify any addition being made.

actual number of beds required in any specialty, therefore, is found by adding to the critical number twice its standard error. One or more additional beds may be provided, according to how much and how quickly it is wished to reduce the waiting-list. The beds available to, and the estimated number required by, the various specialties of the Reading hospitals are shown in table III.

The critical number of beds related to the effective population served by the specialty provides the ratio of beds needed (table IV). Again an allowance must be made for errors due to sampling. At 85% occupancy the estimated number of acute beds required is 1·97 per 1000 of the population, compared with 1·86 beds per 1000 at 90% occupancy, and 1·76 beds per 1000 at 95% occupancy.

General Practitioners' Survey

77 forms were sent to family doctors in the Reading County Borough, of which 43 (56%) were returned, and 114 to doctors outside the town, of which 88 (77%) were returned. Thus of 191 doctors circulated, replies were received from 131 (69%).

Of the 43 Reading doctors who replied, 27 (63%) said that they had no difficulty in arranging admission for their patients, while 16 (37%) said they had, the main difficulty being acute illness in the elderly. 17 doctors (40%) said that they did not send any of their patients to other hospitals than the Reading group (that is, hospitals under the Reading Hospital Management Committee), whereas 26 (61%) said they did. Of these 26, 11 said that patients were sent "very occasionally." The types of patients sent to hospitals outside the group varied, but neurological patients and those needing neurosurgery predominated, followed by orthopædic patients. This is to be expected since special neurosurgical and orthopædic facilities exist in Oxford. Some doctors gave the actual number of cases involved. A fair approximation of the total number sent outside the group would seem to be in the region of 150–200 cases a year. (about 0·5% of the inpatient admissions to the four Reading hospitals).

As might be expected, the results were somewhat different for doctors outside the Reading Executive Council area because of the comparative nearness of other hospital centres. Thus of the 88 replies received from doctors in the county area, only 6 (7%) said that they had experienced difficulty in arranging admission for their patients. On the other hand, 74 (84%) said that they sent some patients to hospitals other than the Reading group, compared with 61% of the Reading doctors. Of the 74, 21 did so infrequently.

Commentary

(J. O. F. D.)

Many found difficulty in accepting the findings of the Nuffield Trust in 1950, though few were able to put forward cogent criticisms of the methods used. This study has produced figures for Reading practically identical with the Northampton and Norwich surveys at a time when the average duration of stay of patients in hospital in the Oxford region has been shortened from 14 to 10 days. The answers to questions put to general practitioners do not suggest any hidden demand. How far can these figures be accepted generally as a guide to hospital planning?

The method used here estimates the population served by a fixed number of beds. The duration of stay has shortened with the pressure of demand. The annual hospital load is measured by the number of discharges and deaths per annum, together with the net change in the waiting-list from the beginning to the end of the year (not the length of the waiting-list.) It might be

TABLE IV—RATIO OF BEDS TO POPULATION

Specialty	Estimated population served and standard error (in thousands)	No. of beds needed per 1000 of the population					
		95% occupancy		90% occupancy		85% occupancy	
		Critical no. with standard error	Estimated no. needed*	Critical no. with standard error	Estimated no. needed*	Critical no. with standard error	Estimated no. needed*
Medicine	212 ± 7	0·43 ± 0·02	0·47	0·45 ± 0·02	0·49	0·48 ± 0·02	0·52
Surgery	178 ± 6	0·50 ± 0·02	0·54	0·53 ± 0·02	0·57	0·56 ± 0·02	0·60
Gynæcology	300 ± 4	0·13 ± 0·005	0·14	0·13 ± 0·005	0·14	0·14 ± 0·005	0·15
Obstetrics	211 ± 9	0·27 ± 0·01	0·29	0·28 ± 0·02	0·32	0·30 ± 0·02	0·34
Ear, nose, and throat surgery	254 ± 6	0·09 ± 0·003	0·10	0·10 ± 0·004	0·11	0·10 ± 0·004	0·11
Traumatic and orthopædic surgery	257 ± 8	0·20 ± 0·01	0·22	0·22 ± 0·01	0·24	0·23 ± 0·01	0·25
Pædiatrics	290 ± 8	0·11 ± 0·005	0·12	0·12 ± 0·006	0·13	0·12 ± 0·006	0·13
Ophthalmology	274 ± 13	0·06 ± 0·005	0·07	0·06 ± 0·005	0·07	0·07 ± 0·006	0·08
Dental	319 ± 11	0·003 ± 0·001	0·01	0·003 ± 0·001	0·01	0·003 ± 0·001	0·01
All acute specialties	228 ± 3	1·71 ± 0·03	1·76	1·80 ± 0·03	1·86	1·91 ± 0·03	1·97

* The estimated no. of beds needed is obtained by adding twice the standard error to the critical no.

possible to discharge patients earlier. The duration of stay in the Oxford region as a whole in 1955 was shorter than the average for England and Wales (medicine 17·6 days compared with 22·2, general surgery 10·9 compared with 13·6), but having discharged patients earlier and earlier it is not necessarily legitimate then to say that the number of beds generally needed per 1000 of the population is that through which patients may have been hustled. This kind of study contributes something to our woefully small knowledge of how many beds are needed, but it is not the whole answer. It would be useful if a number of such surveys could be carried out in different parts of the country, as recommended by the Nuffield Provincial Hospitals Trust.

In this study the population differs for each specialty. At first sight it might appear that it varies with the number of beds available, but this is not quite so since with only a difference of 5% between medicine and surgery the population served differs by 24,000.

Reports of the surveys organised jointly in 1941 by the Ministry of Health and the Nuffield Provincial Hospitals Trust suggested variously that from 5 to 7 acute beds would be needed per 1000 of the population. Some of the investigations stressed the difficulty of assessing the adequacy of hospital services. This Reading investigation suggests that the numbers of acute beds needed may be much less than 5 or 7. Whatever the true figure is, it is likely to be nearer 2 than 5 for Reading.

It may be that the bed needs of different parts of the country differ considerably. The Oxford Regional Hospital Board has less acute beds than the average for England and Wales. The Nuffield Provincial Hospitals Trust hoped that a number of surveys in different areas might be undertaken. It would be informative if the next could be carried out in an area where the bed provision is generous, and it would be interesting to compare the result of such a study with the results shown in this paper. It may be that the similarity between the three surveys which have so far been undertaken is the result of an inelastic supply of beds, the demand for hospital services being brought into equilibrium with the existing resources through the average stay.

It is a pleasure to acknowledge the valuable help of the secretarial and records staff of the hospitals taking part in the survey. We are especially indebted to the North-West and South-West Metropolitan Regional Hospital Boards, to the matrons of the private nursing-homes in the area, and Dr. J. Hazleton (hon. secretary of the Reading local medical committee) and Dr. J. Anderson Hill (hon. secretary of the Berkshire local medical committee) for their assistance and cooperation. This survey was made under the ægis of the Records Committee of the Oxford Regional Hospital Board.

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QUESTIONARY ON INCOME

ON behalf of the Royal Commission on Doctors' and Dentists' Remuneration the Social Survey is sending a questionary on professional incomes to a random sample of doctors. The questionary is to be accompanied by the following statement by the British Medical Association and the Joint Consultants Committee:

1. The British Medical Association and the Joint Consultants Committee (representing the Royal Colleges and the Scottish Royal Medical Corporations, as well as the Central Consultants and Specialists Committee of the B.M.A.) have been given the opportunity by the Royal Commission of examining the enclosed questionnaire in draft. As a result of their suggestions it has been substantially modified.

2. They have made it clear, however, and the Commission agree, that in making these suggestions to the Commission they were not in any way committing themselves either to the value of the questionnaire as a method of ascertaining the facts which it seeks to ascertain or to the appropriateness of such an inquiry as a preliminary to determining what should be the future remuneration of the medical profession. They have explained to the Commission that they reserve completely the right to criticise any unforeseen defects in the questionnaire which the inquiry may bring to light; to criticise the results of the inquiry; and to criticise any conclusions or recommendations which the Commission may base on these results.

3. They have informed the Commission that, in particular, they doubt whether the replies from members of the professions with which Medicine and Dentistry are to be compared will reveal the full range of incomes earned, since these professions have no direct interest in the work of the Commission and it is possible that members of these professions earning the higher incomes, particularly as self-employed persons, will feel no obligation to disclose the amounts of their incomes—not to mention the additional emoluments received in many cases as "fringe benefits."

4. They have been given an assurance that they will have an opportunity of examining and commenting on the figures obtained from members of the various professions included in this inquiry before the Commission finally decide upon their recommendations.

5. The doubts entertained by the British Medical Association and the Joint Consultants Committee have been noted by the Commission who feel, however, that evidence obtained in this way is likely to be more complete than that upon which they would otherwise have to rely.

6. It has been ascertained that the Commission are seeking information about the net professional incomes earned before the war. This information, together with the results of this questionnaire inquiry, might be of assistance in estimating the extent to which effect has been given to the Spens recommendation that adjustments of medical remuneration should have direct regard to the actual increases since 1939 in incomes in other professions.

7. In view of all this, neither the Joint Consultants Committee nor the Council of the British Medical Association believes that there can be any objection to the questionnaire being completed by the doctors selected to receive it. Indeed, *they hope that all such doctors, having read this statement, may be disposed to fill in the questionnaire and to return it promptly to the Social Survey*, since it is most desirable that the Royal Commission should be helped to complete their report at the earliest possible date, whether or not their recommendations prove to be acceptable to the medical profession.

W. RUSSELL BRAIN
Chairman, Joint Consultants Committee.

S. WAND
Chairman of Council, British Medical Association.

GENERAL MEDICAL COUNCIL

AT the opening of the Council's 195th session, on Nov. 26, Sir DAVID CAMPBELL, the president, welcomed as new members Dr. Macdonald Critchley (Society of Apothecaries of London) and Prof. A. L. Banks (University of Cambridge). In accordance with a decision of the council that editions of the *British Pharmacopœia* should be published at intervals of five years, it was proposed to publish early next March a new *B.P.* superseding that of 1953. This would have effect from Sept. 1 next year.

The visitation of medical schools and the inspection or visitation of examinations inaugurated in 1952–53 had almost been completed. A further list of variations in approved hospitals and recognised house-officer posts in the British Isles had been issued. The rate of change was such that the issue of a new complete edition of the list might need to be considered next year. There were now 764 approved hospitals with 1298 medical posts and 1568

surgical posts. In addition there were 382 posts in midwifery (which the Act allowed applicants to count instead of either medicine or surgery) and 24 posts which provided mixed experience.

A fourth edition had been issued of the List of Approved Hospitals in Overseas Countries excluding Colonial Territories.

More than six years had passed since, in April, 1951, the first members of the Disciplinary Committee made the Medical Disciplinary Committee (Procedure) Rules, 1951, by which the proceedings of the committee had since been regulated. The rules were necessarily made before any cases had been heard by the committee. It was not surprising, therefore, that six and a half years of practical experience had suggested possible improvements, many of which would tend towards simplification. Further the Judicial Committee of the Privy Council had advised the Disciplinary Committee to widen the provisions of their present rule concerning the admissibility of evidence.

The new Recommendations of the Council as to the Medical Curriculum had been welcomed, if only for removing some of the obstructions in the way of reform. It had been pointed out that in this field there had been many hindrances to reform, including no doubt the conservatism of medical faculties and certain questions of departmental prestige. But it had also been said that those who were most eager to improve and to innovate were hampered at times by the excessive detail of the 1947 Recommendations of the Council. While the Council felt it necessary to emphasise the need for reducing the existing congestion in the curriculum, they also hoped to encourage schools as far as possible "to instruct less and to educate more." In medical education, as in other kinds of education of which Plato spoke long ago, what mattered most was not the knowledge imparted to a man but what the man himself became in the course of acquiring the knowledge.

The Medical Act of 1858 came into operation on Oct. 1, 1858. In the latter part of next year, therefore, the Council is due to celebrate its centenary.

Personal Papers

CONVERSATIONS WITH SHERRINGTON

A Centenary Reminiscence *

Sir RUSSELL BRAIN
Bt., D.M., F.R.C.P., LL.D., D.C.L.

A MAN'S conversation is more revealing than any description of him, and may tell us more about him even than his own formal writings. That is my reason for putting on record these three conversations with Sherrington. Although I knew him for over thirty years I have notes of only three meetings with him. One was in August, 1947, three months before his 90th birthday; the second in April, 1949; and the third in May, 1950.

* * *

Old age brought no failure of Sherrington's mental powers, but seemed rather the consummation of his wisdom, the completion of a pattern. Though he was not a Catholic his last years were cared for by the members of a Catholic sisterhood, and his visitors, passing a statue of the Virgin on the landing, entered his bed-sittingroom, where Dürer's engraving of a hare hung over the mantelpiece. He was rather deaf and his sight was impaired by double glaucoma. But from the chair to which his arthritis confined him his mind still roamed and questioned. There was still the same pause to find the right word; the same contraction of the corrugator, and then of the frontalis muscle, drawing the brow upwards and to the left; the same deliberate chuckle.

He had been reading French novels, and said he was surprised at the growing interest in French. French is so clear—the ideal diplomatic language, in contrast to German! "Consider Hegel—so vague and cloudy. Philosophers sit in their studies and make a living out of contradicting him." I had recently published in *Philosophy* a paper on the Neurological Basis of Perception, and we talked about this. Sherrington restated his view, which he had expressed in *Man on His Nature*, that brain and mind are incommensurable. Take externality—how could you get that out of the addition to one another of brain-events? Then time—suppose you have a thousand neural connections, quite a small number—how can they all work, and in the right order, in one-tenth of a second? You are handling a piece of china. You drop it, and catch it before it reaches the floor. How is it done? He recalled that Shakespeare made Lear speak more rapidly and more confusedly as he became agitated, till he was almost incoherent. "Ripeness is all," he quoted; "what does it mean?"

Reflexes—the reflex was a useful idea, but it has served its purpose. What the reflex does is so banal. "You don't think that what we are doing now is reflex, do you? No, no, no!" We talked of Craik and his stimulating little book, *The Nature of Explanation*. Sherrington said that Craik was a mechanical genius, who wanted to explain the working of the nervous system in terms of machines. Craik could make something to do what we do when we move our fingers, but you can't represent all that goes on in the cortex like that. What can be the cortical basis of an idea? There are more cells in the cerebral cortex than there are people in the world. The events underlying the simplest idea must be like ants running about in an ant-heap. Some people—surgeons—think that much of the brain is never used. "You don't think that, do you? No, no!"

He then discussed Penfield's work on stimulation of the cortex of the conscious patient. When in this way you elicit the movement, the patient does not feel as if he wills it: he experiences it as though the part was being moved. "You haven't reached the self yet!" Penfield says you can't evoke a percept or an object. Evidently the stimulus is too simple. "If you stimulate a spot and once it says 'yes' and another time 'no,' that is what I should expect." The factors are so many and so changeable. I asked him how he explained the fact that one ceases to hear a sound—for example the ticking of a clock—when one's attention is concentrated on something else, as when one is reading. Sherrington said that he thought inhibition came into this, but agreed that Head's idea of vigilance might be applicable. What about our unawareness of the flexion of the elbow necessary to hold the book?

He told me the story of the first use of diphtheria antitoxin in this country. He was immunising a horse at the Brown Institution, when he heard that his nephew was seriously ill with the disease. The appropriate dose was unknown, but Sherrington and his laboratory assistant bled the horse, and he took the serum down to the South Coast where his nephew lived. The serum was given, the boy began to improve and eventually made a complete recovery. Sherrington in his excitement went off that evening to tell Lister, who was in evening dress entertaining some foreign surgeons, and made Sherrington go in and tell them all about it. Sherrington said Lister, though he was old, and looked old, remained young in his receptiveness of new ideas.

I asked Sherrington how much pain he thought animals felt. He said he thought monkeys and apes felt little pain. Either that, or they have very strong wills. He could see a rhesus monkey now, "sullen, stony, stoical".

We discussed the subconscious solution of problems, and he cited Poincaré's work on this.

*Sir Charles Sherrington was born on Nov. 27, 1857.

We spoke of aphasia, and he asked if the old view of cortical speech centres was still held. I replied: "The question is, what is localised? The old ideas were too simple." He answered: "It is all too simple: all our ideas about the nervous system are too simple." We spoke of Bertrand Russell's views on perception which Sherrington thought left it in the air. Whitehead, he said, was better: but at Cambridge the philosophers would not look at him—he was an amateur. He said that writing verse was very time-consuming—and not only verse. Flaubert would spend a day on a line, and later sacrifice the whole passage.

* * *

When I saw him in 1949 he seemed little changed. "I have lived too long," he said with his rich chuckle; "I am getting very deaf." He gave me a copy of the just-published second edition of his book on Goethe. "There is a belief that Goethe was a scientist, but he was not. He was interested in science." He quoted several of Goethe's lyrics, which he praised. "No-one," he said, "could write lyrics like Goethe, except Shakespeare." The first part of *Faust* was good, but the second part was poor stuff. But Goethe, unlike Shakespeare, created no characters. Even Faust was not a solid being. Gretchen came nearest to it.

He said he saw no prospect of bringing the brain and the mind together: it might take 400 years. Even if the brain is an electrical machine, how does this bring us nearer the mind? Take Shakespeare's plays—they are in a different world from electrical patterns. Moreover, the mind is not in space: not even Einstein's fourfold space makes it any easier. Penfield had described evoking visual scenes by stimulating the brain in the conscious patient, and sometimes the same scene on different occasions, but he said you could not always get the same response from the same spot. "I should be surprised if you could get the same response twice. You, dealing with normal thoughts, and abnormal thoughts as a result of disease, are more likely to achieve a flash of insight than I am sitting in this chair." He reminisced about Sharpey, about Hughlings Jackson being observed by Henry Head observing his migraine, about Gowers' draughtsmanship, and about Bastian. He came back, as he so often did, to Shakespeare. Though he died when he was 52, how good he was at depicting old men. When one grew old oneself one appreciated this. Shaw was jealous of Shakespeare, and sent Sherrington an article which he had written depreciating him. Sherrington thought it such nonsense that he could not bring himself to reply. Then he read a long letter of Shaw's in *The Times*, "full of sound and fury", and he said to himself: "There's Lear! 'Blow! You cataracts and hurricanoes!' But then, Shaw's getting old—he is 92! And he has become, as I am afraid you will have noticed I have, rather garrulous!"

* * *

In May, 1950, he was more frail and more deaf. He asked what I was doing in the neighbourhood, and when I said I was on my way to a wedding, he said: "At my age one regards weddings, I won't say without enthusiasm, but without prejudice!" And then came his characteristic chuckle. The wedding was at Tunbridge Wells, which reminded him of a passage in Evelyn's diary describing how he was robbed by highwaymen there. He could still talk with interest about literature, his delight in Shakespeare, and his enjoyment of Stevenson and the romances of his youth. As I said goodbye I promised to come and see him again. "If I am still here," he said.

Professor John Eccles has allowed me to quote in conclusion two remarks which Sherrington made to him a few days before he died. "For me, Jack, the only reality now is the human soul." And, "Keep on struggling for the reality of the spirit. It is something the world needs."

Conferences

PSYCHIATRY

A SPECIALIST conference on psychiatry, arranged by the University of Glasgow and the Royal Faculty of Physicians and Surgeons postgraduate medical education committee, was held in Glasgow from Oct. 28 to Nov. 1.

Schizophrenia

Dr. A. C. TAIT regarded schizophrenia as a group of genetically determined, though environmentally precipitated, biochemical disorders. The search for an endotoxin in schizophrenia has a long history, reflected today in Heath's work on taraxein. This substance is isolated from pooled schizophrenic serum and, when given to normal subjects, produces primary schizophrenic symptoms. According to Hoffer, some adrenal involvement may produce a natural psychotoxic substance. It seems that there is not one single biochemical answer but probably a set of answers. While the biochemists and electrophysiologists are trying to identify changes, the clinician must attempt to delineate on clinical grounds various subgroups of schizophrenia.

Mr. R. M. MOWBRAY dealt with the implications of experimentally induced psychotic states. The perceptual qualities of these experimental hallucinations tend to mark off the hallucinatory states produced by phantasticant drugs as phenomenologically different from those in schizophrenia. If one compares the symptoms of schizophrenia with the experiences induced both by the phantasticant drugs and by the isolation experiments of Hebb and of Lilly in restricting sensory input, then there seems to be little ground for using such terms as "psychotomimetic" to suggest that such experiments mimic a schizophrenic psychosis. The term "isolation" should not tempt one to relate the laboratory findings to the social isolation often implicated in the pathology of schizophrenia.

Dr. T. FREEMAN said that the signs and symptoms of schizophrenia can be viewed as abnormalities of ego function. By regression there is a re-emergence of primary processes and a degradation of thinking processes to the stage where representational thought ceases to exist. Mental functions consist then solely of bodily functions. Attention to the problems of ego psychology may make it possible to map out systematically the state of the ego function in schizophrenia, leading to better methods of grouping and recognition of syndromes.

Mr. A. MCGHIE differentiated the schizophrenic impairment in conceptual thinking from that observed in organic states. The schizophrenic seemed to have a logic of his own, but the patient with organic disease seemed to have no logic. While there was agreement that schizophrenic thinking resembled that of a young child, it was hard to use the regression hypothesis adequately. Volitional disturbance was manifest in the schizophrenic inability to follow a determining idea. Perceptually the schizophrenic patient seemed to be at a developmental level genetically equivalent to that of the young child. The view of schizophrenia as a disorder of communication was commended. The inherent difficulties were pointed out in the use of normal thinking as a criterion for schizophrenic thinking.

Dr. HUNTER GILLIES said that early cases of schizophrenia are often misdiagnosed as neurotic, but the neurotic component arises from the stress involved in the onset of so cataclysmic an illness. A detailed history was important, and attention should be directed to minimal clinical symptoms such as disordered thinking, disordered affect, volitional disorder, and autistic withdrawal (often viewed as a psychological reaction but in fact a primary symptom). Such symptoms as hallucinations, illusions, catatonia, and stereotypies were secondary and more characteristic of the established condition.

Interpersonal involvement with a case was not necessarily an advantage in diagnosis. The more one knows a schizophrenic, the more likely one is to make allowances and to overlook the basic core of the disease.

Dr. I. R. C. BATCHELOR (Dundee) said that, though its ætiology might be organic, schizophrenia is not purely a physical disease, and a psychotherapeutic approach will continue to be valuable whether it is basic or conjunctive. The therapist has to act as a bridge between patient and reality. The important influence of the nurse has only recently been specifically studied and turned to planned account in the establishment of therapeutic communities in the mental hospital.

Dr. H. J. B. MILLER described his own methods of rehabilitating chronic schizophrenic patients. Many such patients lead inactive, socially isolated lives in overcrowded wards. The long-stay ward is the worst possible environment. Chronic patients represent a significant potential labour force, and many can be employed outside the hospital.[1] Existing legislation about payment of patients needs to be altered in the light of this new approach to rehabilitation.

Tranquillisers

Dr. W. MAYER-GROSS (Birmingham) pointed out that formerly the psychological effects of drugs were regarded as unwanted side-effects, but now they were deliberately exploited and studied.

Animal experiments and discoveries in electrophysiology have led to a knowledge of the function of subcortical structures such as the reticular substance of the mid-brain. New sedative substances, such as chlorpromazine, had been introduced for specific purposes.

The study of drugs that produced psychotic-like states was also of great interest and had led to hypotheses of the ætiology of schizophrenia, based on apparent similarities of chemical structure. So far they had not proved fruitful.

Dr. J. LEWIS classified tranquillising drugs as :

1. True antipsychotic agents, with main action on subcortical centres of brain and with pronounced but less important autonomic and peripheral effects.
2. Interneuronal blocking agents, where the peripheral component was more marked.
3. Anticholinergic agents, with no apparent relation between anticholinergic potency and tranquillising activity.
4. Anti-histamines, some with sedative and hypnotic properties.

Many of these drugs are adrenergic blocking agents. This might indicate the importance of noradrenaline distribution in brain. The role of serotonin in tranquilliser activity is complex, but is a fruitful line of investigation. Tranquillisers are not like the classical nervous-system depressors in that they have a selective effect on subcortical centres and only in larger doses affect higher centres.

Dr. J. R. ROY had reviewed the literature on the most commonly used tranquillising drugs, and concluded that there is little real evidence so far that they have a significant part to play in the management of the neuroses.

Dr. W. A. CRAMOND spoke as a medical superintendent of the transformation in his hospital and of the changed attitudes of mental-hospital staffs since the introduction of tranquillising drugs. Chlorpromazine, in states of psychomotor excitement, tension, aggression, and preoccupation with hallucinations, does not cure but controls symptoms and leads to the effective use of other therapeutic measures within the hospital environment. We must beware of regarding such drugs as chemical forms of restraint. While they are used to relieve symptoms, they are not substitutes for intimate contact with the patient. Psychiatrists should be protected from the deluge of tranquillisers by some organisation able to conduct drug trials on a national scale analogous to the work on antituberculous drugs.

1. Miller, H. J. B. *Lancet*, July 13, 1957, p. 87.

Dr. A. G. MELROSE described the toxic effects of tranquillising drugs. Most of the side-effects from this group of drugs are trivial ; a few are potentially lethal. Two broad groupings were considered :

(1) The predictable side-effects—an exaggeration of the expected pharmacological effects (e.g., parkinsonism from the use of high doses of reserpine or chlorpromazine).

2. The group of unpredictable toxic effects that are rarer and seem to be allergic in nature. These include rashes, serious blood dyscrasias, and jaundices.

The most dangerous of these toxic effects is agranulocytosis, which has been reported from the use of chlorpromazine and other members of the phenothiazine group. This complication often sets in with dramatic suddenness and cannot be predicted from routine leucocyte counts. It is very important that the patient should be instructed to report the onset of certain well-recognised symptoms, such as sore throat, malaise, and pyrexia, and that the drug be withdrawn at once. If this is done the agranulocytosis can be treated by blood-transfusion, antibiotics, and corticotrophin. Jaundice is commonest during the first three weeks of chlorpromazine therapy, and seems to be an allergic reaction. In the uncomplicated case there is no danger to life, and the jaundice usually clears rapidly, even if the drug is continued.

There is no need for undue trepidation in the use of these drugs. With careful supervision they may be used with safety.

Mental Deficiency

Dr. R. BAILEY (Edinburgh) said that because inherent causes played such a predominant part in mental deficiency, it was assumed that little could be done. But large-scale surveys of defectives indicated that a high proportion of cases arose from environmental and social factors.

Dr. R. C. MCGILLIVRAY held that defects in germplasm were the most commonly recognised single cause of mental defect, and therapeutic aims were turning to possible methods of influencing the expression of genetic factors. In phenylketonuria, for example, the defect is in the enzyme for oxidising phenylalinine, and dietary measures in therapy are promising. With the contemporary increasing knowledge of the involvement of enzyme systems and of genetic factors a new classification of oligophrenia was needed.

Dr. BRIAN KIRMAN (London) spoke of studies of phenylketonuria which had shown that there could be damage to the brain by abnormal chemicals produced by inherited abnormalities, and that alterations in diet might result in improvement in the mental deficiency ; but the problem is highly complex. It seems that there are critical periods in development at which such defects can produce severe irreversible damage. It is no longer believed that the effects of genes are inevitable, and it is permissible to hope that modification of the fœtal environment may prevent the development of abnormal gene effects.

Dr. K. R. H. WARDROP felt that there was a danger of overrating the contribution of mental defect to criminal behaviour. The attitude represented by the statement that every criminal was feebleminded and every feebleminded person a criminal had given place to a multifactorial hypothesis in which low intelligence is regarded as probably not a very important factor. There are many fallacies and difficulties in estimating intelligence levels.

The group of delinquents who are also significantly dull mentally presents a very serious treatment problem.

Genetics and Biochemistry

Prof. L. S. PENROSE (London) paid tribute to Garrod's concept of inborn errors of metabolism. The usual approach to such disorders is to attempt to elucidate the underlying disorder by performing biochemical tests, but it must be remembered that there are individual

differences in chemistry as in other properties. The changes seen clinically and in response to biochemical tests are very indirect results of the underlying gene change. Environmental factors are very important.

Dr. JOHN ROPER spoke of the rapid development in biochemical genetics. It has been discovered that genes determine the specificity of enzymes, and hence control each step of metabolic processes. Recent research by Ingram on the abnormal hæmoglobins in sickle-cell anæmia has shown that each gene has a primary specific function. The environment, however, decides to what extent the gene effects are expressed. The environment can compensate for a mutation by altering the phenotype. The problems are complex; thus in certain cases mutation in any one of several genes can produce apparently similar effects (mimics). There may be interaction between different genes, or a single gene may underlie multiple observable characteristics (pleiotropism).

SEX INSTRUCTION FOR MEDICAL STUDENTS

ON NOV. 16, at Cardiff, the British Medical Students' Association held a symposium on the Teaching of Sexual and Marital Relations to Medical Students.

Dr. GRAHAM GRANT, senior health officer to the University of Wales, who was in the chair, quoted Osler to the effect that a doctor whose help is sought in a domestic tragedy will fail if he has not been properly trained. Sex education for medical students was part of a wider programme of sex education for the community. Discussion of the Wolfenden report showed that sex was discussed more openly today.

Dr. BERNARD SANDLER (Manchester) pointed out that the student often had sex problems of his own. A child's attitude to sex was unconsciously moulded by its parents' attitudes; disgust was a feeling inspired by faulty parental attitudes. Sex education was more than instruction in physiology and technique; it embraced the whole of the relationship between man and woman. A motorcyclist should know the Highway Code as well as how his vehicle worked. Many patients had sex difficulties, overt or concealed, and the doctor was often unable to help because he had had inadequate or no training.[1]

Dr. SYLVIA DAWKINS (London) spoke on the need for the teaching of contraception. Control of family size was one of the first conditions of family welfare. People were often advised to avoid pregnancy but not told the method; failure to find an acceptable one led to much misery and even abortions. Any doctor showing sympathetic interest in his patients' problems would be asked about contraception, and should at least know where to send them. The Royal Commission on Population had recommended that such advice should be given through the National Health Service by family doctors.

Dr. CLIFFORD ALLEN (London) made no apology for discussing sexual perversions, saying that all diseases were unpleasant; but masturbation was the normal introduction to sex in our society, and there was no such thing as excess of intercourse. Sexual abnormalities, especially homosexuality, were much commoner than (say) acromegaly, though much less was said about them in medical schools. A doctor might meet homosexuality in a hidden form—e.g., in a man who complained of impotence after ill-advisedly marrying in the hope of curing his anomaly. Many homosexuals were curable, especially those with neurosis, and those who had drifted into such a relationship because they were timid and afraid of women. Happiness depended enormously on harmonious sex life; much responsibility for promoting this harmony lay with doctors, and their teachers. Lectures, and case-demonstrations with one student at a time, were useful. Students should take psychiatric case-histories with details of sexual activities.

Prof. H. C. MCLAREN (Birmingham) was opposed to much formal instruction in sex, though books about it should be available. He gave one lecture a year, in which his chief aim was to tell students where to find such books, and to instill in them some humility and realisation of their incompetence to advise patients on these matters. The marriage-guidance and birth-control clinics were open to students, who should be taught about sex informally in the course of other teaching. Only more senior doctors were likely to be consulted on sex topics, and only a tenth of doctors had the right personality and ability to advise patients on sexual abnormalities; difficult problems should be referred to the expert, as they would be in any other sphere. He placed much value on a tutor system, providing the tutors were well chosen and gave students insight into a normal home life.

Several students then spoke. Most began with an account of the instruction given at their own schools. This ranged from no formal instruction to five lectures; sometimes sex instruction was incorporated in the teaching of social medicine or gynæcology. At most schools students could attend the birth-control, fertility, or marriage-guidance clinics, and at some time there were discussion-groups or tutor schemes.

Mr. R. MARCUS (Bristol) felt that students should at least be aware of the fact that 33% of babies were conceived out of wedlock, and that contraceptive instruction for the unmarried might be desirable. Mr. J. W. SCOTT ANGUS (Edinburgh) said that sex needs an adult outlook, which cannot be taught; but Mr. J. W. OGILVIE (Oxford) felt that the tutor system helped to turn a boy into an adult. Mr. M. H. IRVING (Liverpool) said that not only young doctors but students were consulted on sex matters, and instruction should come early in the course. He referred to an American scheme by which a student was attached to a family throughout his medical course, and saw children growing up. Mr. JOHN BALDWIN (Aberdeen) called for sex instruction to schoolchildren. Miss A. P. BRADFORD (Aberdeen) thought that in this age of frankness even children knew about sex, and the doctor should know enough to be able to answer questions. Mr. T. SILVERSTONE (St. Bartholomew's) thought that it was harder to learn to take an unembarrassed history than to learn the facts of sex, but Miss E. CRAIG (Glasgow) felt that much general practical advice was needed. The doctor must at least know what are the common difficulties. She thought that it was especially difficult for unmarried doctors to give the advice they were asked for. Mr. E. J. R. ROSSITER (West London) said that this was one of the few countries where nearly all medical students were unmarried, which he thought unhealthy. Mr. P. COLLIS (Birmingham), who thought that the first step was the solution of the student's own problems, supported Professor McLaren; but Mr. D. HUNTER (Belfast) thought that the family doctor should treat all his patients. All medicine, he said, is psychosomatic. Mr. W. G. S. RUSSELL (The London), president of the B.M.S.A., wound up for the students with the observation that they were taught abstruse neurology, but common sex difficulties were ignored. A student who spent much time with a patient might learn things about her that a consultant, who saw her only on his weekly ward-round, had not unearthed. The young were asked for advice as well as the old.

The main speakers then replied to points raised.

Professor MCLAREN agreed that history-taking was a part of treatment, but he thought that psychotherapy was beyond the scope of the family doctor (or the gynæcologist). He was against compulsory instruction in sex or in anything else. Contraception was not the best means of cutting down the number of extramarital pregnancies, but he did not know what was.

1. Sandler, B. *Lancet*, 1957, i, 832.

Dr. ALLEN agreed that long or deep analysis should be left to specialists; but a kind approach was therapy, for many patients were frightened, and were helped by being allowed to express their anxieties to a willing listener.

Dr. DAWKINS favoured informal discussions as a means of instructing students. She did not approve of wholesale instruction in contraception to the unmarried as a means of reducing illegitimacy; in Sweden such instruction was freely available, and the illegitimacy-rate was very high. But no doctor should try to impose his own moral standards on patients; nor should he give advice. Rather he should help his patients to discover what they really wanted to do, and teach a greater sense of responsibility about the sexual relationship.

Dr. SANDLER, who was astonished at the good reception given to the main speakers, thought that sex education should begin before school—that it should be given to parents rather than schoolchildren. A mature attitude to sex was more desirable than contraceptive instruction for the unmarried. He warned the women students that some men get fixations on women doctors. History-taking was listening, not only asking questions; thus, every good doctor was a good psychotherapist. Good teachers were needed for sex instruction for students, but were hard to find; they feared a ribald reception. But such fears were groundless if the teacher was both sure of his subject and sincere in his approach.

Dr. GRANT, summing up, said that students wanted more sex instruction, in small groups, and not many lectures—though they were better than nothing. Mature tutors were needed. Of illegitimacy, he said that there was no solution to some problems. Finally, he quoted Dr. J. D. Kershaw as saying that love was blind, but need not be mentally defective as well.

Medicine and the Law

Responsibility of House-surgeon

WHAT degree of responsibility rests upon a house-surgeon who acts on the instructions of a consultant? If the house-surgeon does not carry out the instructions properly, he may of course be liable in damages to the patient. In a recent case, however, the instructions turned out to be wrong.

In 1953 a boy, then aged 6, fell off a garden gate and injured his arm.[1] He was taken to hospital and examined by a consultant who instructed the house-surgeon to treat the patient for a simple fracture. The house-surgeon set the arm in plaster, and the boy was discharged the following day. There was afterwards some dispute as to whether the house-surgeon was told to admit the patient for penicillin treatment, but the court appear to have been satisfied that the treatment was appropriate for a simple fracture. In fact, the fracture was an uncommon type—namely, a greenstick which was also a compound fracture.

Shortly after the boy returned home, gas-gangrene developed in the arm, and he was taken back to hospital in a serious condition. By the valiant efforts of the consultant the boy's life was saved, but it was necessary to amputate the arm.

The boy's father sued the house-surgeon for negligence, but the trial judge found in favour of the house-surgeon and this decision has now been upheld on appeal.

Giving the leading judgment in the appeal court, the Lord President was clearly satisfied on the evidence that the house-surgeon could not be regarded as having been in charge of the case. It had, however, been contended that this did not absolve the house-surgeon. His Lordship rejected that contention, holding that responsibility could not rest on the person who acted on instructions.

1. *Scotsman*, Nov. 9, 1957.

His Lordship also rejected the contention that the case should be treated as an exception to the general rule, in that the house-surgeon knew of the danger of infection and had stated in evidence that she was not happy about the treatment she had been instructed to carry out. It had been argued from this that she should not have persisted in the treatment. His Lordship commented that this would mean that her responsibility could have been less the more callously and unthinkingly she carried out her instructions. For such a proposition, there was no justification.

His Lordship also pointed out that the expert evidence had shown that a house-surgeon of ordinary skill and competence might have considered this fracture to have been a simple and not a compound one. In these circumstances, he was quite unable to hold that professional negligence on the part of the house-surgeon had been established; it was in vain to contend that a highly-skilled specialist might have concluded otherwise.

The case would seem clearly to establish that—at least as a general rule—a house-surgeon is not liable if he carries out instructions. The reported judgments are less clear on what the position might be if a house-surgeon of ordinary skill and competence ought to have realised that the instructions were wrong. In view of the medical evidence, this was a point on which a decision was not required in the present case, and the question had best be regarded as still open.

Death from Oxygen Therapy

AT a Manchester inquest on Nov. 20, a verdict of death by misadventure was recorded on a woman who had died of heart-failure after an operation. She had broken her nose as a child, and one nostril was very narrow. On Nov. 16 she had a short operation under general anæsthesia. When she returned to her bed the sister noted that she was cyanosed, and began to administer oxygen through an endotracheal tube in the wider nostril; the other was obstructed by mucus. After "only about a second" the patient appeared so ill that the sister summoned the anæsthetist, but the patient died almost immediately.

At necropsy it was found that oxygen had made its way into the thoracic cavity, leading to pressure on the heart and collapse of both lungs. High pressure had been built up because the second nostril was blocked and the tongue had fallen back, obstructing the mouth.

Public Health

The Flying-boat Disaster

IN the House of Commons last week the Minister of Transport and Civil Aviation, Mr. Harold Watkinson, made a statement about the flying-boat accident on Nov. 15. A Solent flying-boat of Aquila Airways took off from Southampton Water for Lisbon at about 10.46 P.M. Nine minutes later the captain signalled that he was returning in a hurry with no. 4 propeller feathered, and soon afterwards the aircraft crashed near Chessell, in the Isle of Wight, and caught fire. Of the 58 people on board, 43 were killed, 2 died later, 4 were seriously injured, and 9 less severely hurt. A public inquiry into the accident is to be held.

Dr. H. M. King asked Mr. Watkinson whether he would put to the Minister of Health the points raised by Mr. J. B. Priestley that ambulances are without morphia and plasma and that both would have been invaluable in this accident. Mr. Watkinson said this was a matter relevant to the inquiry. Mr. Priestley, who went to the scene of the accident soon after it happened, commented (in an article in *Reynold's News*) on the lack of morphine in the ambulances.

Morphine can in fact be carried in ambulances, but a special case must be put to the Home Office before a

licence is granted. Few local authorities hold such a licence. When morphine is carried, it can be given only on the instructions of a doctor, and most local authorities rely on a plan by which morphine arrives at the scene of an accident in a doctor's charge. The ambulances which went to the flying-boat crash carried plasma and intravenous giving sets. The first ambulance reached the scene, which is more than 8 miles from the main ambulance depot in Newport, at about 11.15 P.M., and the first doctors between 11.15 and 11.30. They gave morphine to the seriously injured, but no plasma was used because immediate removal to hospital was judged the best course.

In dealing with the flying-boat crash, the police and local-authority and hospital services conformed to a prearranged "major disaster" plan, which worked very satisfactorily. The day after the crash, 2 seriously ill patients were transferred by helicopter from St. Mary's Hospital, Newport, to Odstock Hospital, Salisbury; and a week later another patient was similarly moved.

Why Children are not Immunised

Dr. E. D. Irvine, medical officer of health for Exeter, asked his health visitors to call on every family where a child had been born in the period August, 1954, to July, 1955, for whom the health department had no record of immunisation against diphtheria. In his report for 1956, he says that in many cases the child had in fact been immunised by the family doctor, and in others the family had moved. Of the children not immunised, the reasons were :

Parents refused (40 cases). Both objected, 17; father objected, 7; mother objected, 14; grandmother objected, 2. The reasons for objecting were all vague.

Medical reasons (22 cases). In 8 cases the reason was infantile eczema, and in 5 recurrent bronchitis.

No definite reason (113 cases). In all these the parents promised to have the child immunised, but none have done so.

62 other children were immunised following the health visitor's call. In 14 cases there were reasons why the child had not been immunised; in 48 there were none.

Of 325 children not vaccinated against smallpox, the parents absolutely refused in 110 cases, and there were medical reasons in 24 cases.

Restrictions on Cumberland Milk Removed

The Minister of Agriculture, Fisheries, and Food announced last week that the radioactivity in milk produced in the area remaining restricted in Cumberland after the accident at the Windscale plutonium factory had now declined to very low levels. On the advice of the Medical Research Council, he accordingly authorised the Milk Marketing Board to resume the normal collection and distribution of milk from noon on Nov. 23. From that date all restrictions on the use of milk produced in the area were removed. A letter announcing the removal of the restriction was sent to all farmers concerned.

Air Pollution

A European conference on air pollution, said to be the first international meeting on this subject, was held in Milan on Nov. 6–14 at the instigation of the European office of W.H.O.

A questionary circulated to participating countries had shown that the ill effects of air pollution give cause for alarm in view of ever-increasing urbanisation and industrialisation. In some countries measurement and control are not carried out systematically. Few people are specially appointed to deal with prevention and control.

The conference felt that further research is needed, and was particularly interested in the interview survey methods which have been used in some countries to investigate a possible relation between air pollution and minor illness. It concluded that special studies are needed to establish pathological and diagnostic criteria for diseases that may be related to air pollution. The conference showed interest in measures designed to reduce pollution from motor-vehicle exhaust gases. Converters that will oxidise unburnt exhaust vapours are in experimental use.

Parliament

Protection of Children

IN the debate on the adjournment on Nov. 18, Mr. FREDERIC HARRIS said that public opinion had lately been shocked by two child murders by sexual offenders. He recalled that one of the men convicted had a record of sexual offences and some months ago had made murderous threats which a prison doctor had said he might carry out. It was disturbing, absurd, and unrealistic that a man with such a record should be free instead of being detained and treated. He asked the Home Office for protective administrative action. Mr. PHILIP GOODHART said that the British public did not like to see people detained for long periods in prison or in mental hospitals without good cause. But many people, in particular many parents, were perturbed by the thought that people who had assaulted young children came out of prison uncured, unrepentant, and, sometimes, even untreated. Could society do nothing to protect itself until a murder had been committed. Must we always wait until it was too late?

Mr. J. E. S. SIMON, the joint under-secretary of State for the Home Department, said that he understood the feelings of those who asked that some drastic action should be taken, but horror and revulsion were not good counsellors. It was not true that there had been a great increase in child murders recently. Between the time when the Homicide Act received the royal assent on March 21 this year and Sept. 30, 32 children were murdered. The number during the corresponding period in 1955 was 34. In both periods most of the victims were murdered by their parents, who either committed suicide or were found to be insane. In the 1955 period there were 3 murders of children which appeared to have a sexual motive. In the 1957 period there were 4, and in addition 2 children were killed with motives which were not clearly established.

He accepted the importance of preventing offences against children, and the proposals put forward would be considered carefully. But we must face the fact that the only way of making certain that sexual offenders did not repeat their offences was either to detain them or to put them under a supervision so close that they were never out in public alone. The House should consider what this would involve. Some 5000 people were convicted of sexual offences annually. The Cambridge Department of Criminal Science's survey tended to show that over four-fifths of those convicted of sexual offences were so convicted for the first time, and that of those first offenders only 1 in 10 was reconvicted. It would clearly not be right to put under prolonged supervision, still less detention, the many people who would not be convicted again. But, of course, no one knew who was going to be convicted again. Under a fifth of offenders had one or more previous convictions for sexual offences. The longest records were most characteristically of those found guilty of indecent exposure and homosexual offences, but no tendency was observed for offenders to progress from less serious to more serious offences. These figures suggested that persistent offenders formed a very small proportion of those convicted of sexual offences and that special measures, if applied, could be justified only for that very small group. Further, a great many sexual assaults were of quite a minor character. Should we be justified in putting people repeatedly guilty of, say, indecent exposure or of minor assaults, but not certifiably insane or mentally defective, under detention or supervision on the offchance that they might one day commit a murder? It would be alien to all that we believed constitutionally to lock up anybody because he might be a criminal.

Courts already had the power to sentence the more serious sexual offenders to preventive detention if they had the necessary qualifying sentences. Many sexual recidivists also had a record of non-sexual crime which might qualify them for preventive detention. Obviously, before arriving at that stage, one would hope that remedial measures had been employed, and Mr. Simon pointed out that at Wormwood Scrubs, Wakefield, and Holloway there were psychiatric units which had had a

singularly high degree of success. The Prison Commissioners were this year starting building the psychiatric prison at Grendon Underwood.

Hitherto the normal run of reprieved murderers had been released after something like nine years, but the passing of the Homicide Bill, he admitted, had brought a new problem. We did not know how long it might be necessary to detain some of those who were now being sentenced to life imprisonment, but some might have to be detained for a very long time indeed. He assured members that before any murderer was released, the most careful consideration was given to the question of whether there was a risk of his repeating his offence and that no murderer was discharged merely because a given time had elapsed.

Doctors' and Dentists' Remuneration

Mr. ARTHUR BLENKINSOP asked the Prime Minister whether he had directed the attention of the Royal Commission on Doctors' and Dentists' Remuneration to the Government's statement that increases of remuneration should be related to increases in productivity.—Mr. HAROLD MACMILLAN replied: No, Sir. The terms of reference of the Royal Commission are as I announced on Feb. 28. Mr. BLENKINSOP: May I take it that Her Majesty's Government will not take the action in relation to doctors that they have recently taken with regard to the more junior staff in the health service? Mr. MACMILLAN: The Royal Commission was appointed with certain terms of reference, upon which I do not intend to put any gloss, but I have no doubt that the Royal Commission has regard to the general movements of affairs like any other people.

Mr. HUGH GAITSKELL: Are we to understand from that reply that the Government are liable to impose a veto on any recommendations for changes in salary scales among doctors and dentists?—Mr. MACMILLAN: No, Sir. Only the right hon. Gentleman would make so foolish an assumption.—Mr. GAITSKELL: The Prime Minister, of course, is as usual rude and arrogant. Neither his answer nor his manner disposes of the issue here. I would ask him again, since a Royal Commission is investigating the whole question of doctors' and dentists' remuneration, whether he is prepared to give an assurance that the recommendations of such a Royal Commission will be considered on their merits by the Government and will not be rejected in the same manner as was the health service employees' application.—Mr. MACMILLAN: If he will look at the terms of reference, the right hon. Gentleman will find that they are as follows:

"(*a*) How the levels of professional remuneration from all sources now received by doctors and dentists taking any part in the National Health Service compare with the remunerations received by members of other professions, by other members of the medical and dental professions, and by people engaged in connected occupations;

"(*b*) What, in the light of the foregoing, should be the proper current levels of remuneration of such doctors and dentists by the National Health Service;

"(*c*) Whether, and, if so, what, arrangements should be made to keep that remuneration under review . . ."

Those remain the terms of reference of the Royal Commission, but it would be foolish not to recognise the fact that the Royal Commission, I have no doubt like any other body of men, is cognisant of the general economic conditions of the country.

QUESTION TIME

Openings in General Practice

Dr. D. JOHNSON asked the Minister of Health how many general-practice vacancies were filled by executive councils during 1955 and 1956; and how many of these vacancies were granted to doctors who had previously practised as principals, as principals in the same executive-council area, and as assistants in the same executive-council area, respectively.—MR. WALKER-SMITH replied: The figures for single-handed practices declared vacant by executive councils in England and Wales are as follows:

	1955	*1956*
No. of vacancies	114	114
No. filled by principals	34	26
No. filled by principals in same executive-council area	21	15
No. filled by assistants in same executive-council area	16	14

In England Now

A Running Commentary by Peripatetic Correspondents

I JUDGE the passage of years by the time it takes me to walk from my parked car to the Agricultural Hall each November. By 1963 I shall be leaving it somewhere south of Battersea. Having met a bloke the other week who had never *been* to Our Exhibition, perhaps I should explain what I mean. Some time round about now, when you've got the bulbs in, you climb into your car and drive to the heart of Westminster, where, to your great surprise, you find a great lump of countryside with trees and people playing rugby football. After driving round in circles for several hours you manage to slip in behind a departing furniture van and face the long walk. In the Hall itself you find a place like Earl's Court gone small, simply seething with pills, plasters, and potions. Every tranquilliser that has ever been born can be found there, with anæsthetic machines by the coil, and surgical instruments hanging in great weird clusters. Drug houses you don't know existed call your attention to yet another compendium of those old friends aspirin and phenacetin: permutations and combinations of all sorts of drugs tumble over themselves to make the place rather like a pharmacist's nightmare. Over the years you learn where to find what, and especially acquire the great art of Not Taking What You Don't Want. From 1948 to 1951 our house was piled up with tabellæ, pilulæ, and pessi to the danger of life, and all quite useless: but not now. With my huge family it's handy to stock up at the beginning of the plague season with wound dressings, antibiotics of a reliable sort, analgesics, nasal sprays, &c., though I can't honestly say that my therapeutics are much influenced by what I am told.

And there are other attractions. A well-known manufacturer of cocoa refreshes the throng with beverage and biscuits: I fear that one day they will discover that their products are not prescribable on E.C.10 and close down. I shall then not go again. Drinks of orange squash and meat extract are also to be found, and I have even known of People who Know People being invited behind velvet curtains for sherry, but that hasn't come my way yet: a desk diary and a superannuated ballpoint pen are about my limits. Then there's a chance you'll meet some old friend, and there's a luncheon hall and bar to take him to, not to mention film shows and exhibitions for those absorbed by abdominal aortography or the way to make the Salk vaccine. No free teas these days, alas.

So I go every year, although I feel more and more guilty over my prescriber-resistance. But perhaps this year I was influenced subliminally: solemn thought.

But you've got to take the risk of being told over the loudspeaker: "Attention, will owner of car FAC 678 go to it at once," where you will find a coal lorry has jammed trying to pass and an irate policeman is itching to get at you with his little book. You will at least be able to offer him a small ballpoint pen with "Hormones" written on the side.

* * *

A piper of the Scots Guards piping furiously in a sort of B.L.B. mask while his oxygen consumption was measured, the full band of the Corps playing one of the new field medical companies on to the parade ground, Automedon alighting from a helicopter in the jungle, these and many other incidents enlivened the three days of the annual exercise of the Army Medical Services. I hope that gimmicks and playlets are not going to be overdone as a method of instruction. The exercise alone was sufficiently impressive as a demonstration of the many-sided activities of the A.M.S. in prophylaxis, treatment, and research, in peace and war, in hot climates and in cold. A civilian neurosurgeon, paying tribute to the pioneer work of the Army, suggested that it might lead the way towards reintegration of all the surgical disciplines which have been fractionally distilled in recent years. At lunch one day I discussed the problem of recruiting with an eminent psychologist. The trouble was, he said, that the Army was organised on an out-of-date social structure. I pressed him for elucidation, and I gathered that responsibility and skill are rewarded less widely with higher status in the Army than in civil life. The social revolution which has converted the ratcatcher into the rodent officer has

not yet touched the Army. In other words, there ought to be many more officers and N.C.O.s and fewer private soldiers. It seems that the old joke about the foreign army which was all colonels and no privates is not as funny as we thought.

* * *

"Let it cool down, turn it upside down and wait till it gurgles." As my peripatetic colleague pointed out (Nov. 16), this is sound treatment for some kinds of ailing refrigerators. It worked wonders on our first, which we bought for £2 10*s.* when we first set up house; on its twin, tweedledee, which a charitable friend passed on to us when the demands of the family were overtaxing the capacity of tweedledum; and finally on our latest model, which is big enough to hold a body and cost us £7 10*s.* at an auction sale. But refrigerators are not the only things that benefit by inversion. Leaving aside modern art, I once read somewhere that an eminent mathematician named Legendre derived a simple formula for elliptical integrals (whatever they may be) by taking the equations which had baffled his predecessor (whose name escapes me) and simply turning them upside down. And in medical research, which consists by and large in trying out a succession of ideas which come to nothing, it is always worth while inverting a working hypothesis which belies its title before discarding it.

In fact it is, or should be, recognised as a general philosophical principle that inversion is a legitimate manœuvre which should always be entertained whenever anything of human designing, from a machine or a process to a political dogma or a philosophical principle, fails to come up to expectations. For a refrigerator, it is as well to disconnect the gas first.

* * *

When I read this little exercise by our "adopted" Hungarian girl of seventeen I felt it said so much in such simple words that I wanted to share my enjoyment peripatetically. Her account of Winter Evening ran:

This is one of the many things what are different in many countries. In Hungary my hobby was in the Winter, to spend the evenings out, on the streets, or on the mountains. This was really marvellous. I did not mind the cold, because I loved so much to walk in the big hard snow, what creaked under my legs. I loved to go to the mountains, to Buda and look at the beautiful Pest, where everything was white. This was so pleasing, that I thought, how can be something so wonderful. Before me was the Danube, behind the Danube, the white city, next to me the attractive mountains also with white cover. These was most marvellous in the evening, when everything was dark and quiet.

But here, in England, I mean in Wales, if I want a lovely evening, I sit by the fire, and I change my place in every two minutes. Because by the English electric fire, either my back is burning, and my legs are freesing or in the reverse. But I am never wam in all parts of my body. But nevertheless I prefer to change my place all evening, or go to bed with a hot water bottle, than walking in the streets in the rain.

Her teacher marked her essay "7/10 good try," and I agree.

* * *

The other day I went into a bookseller's and asked for a copy of Sir Russell Brain's *Tea with Walter de la Mare*. The assistant, a sweet young thing with a pony-tail, delighted to show her erudition, said to me more in sorrow than in anger, "You've got the title wrong, you want *Tea and Sympathy*, the book of the film."

* * *

Rupert Montgomery Adelobo-Bo paid his first visit to the infant-welfare clinic when he was three weeks old. He let forth ear-piercing shrieks throughout his weighing and examination, and we were not sorry to see him go. The following week, however, he behaved like an angel and the only sound he produced was a happy coo. When the health visitor remarked on this his mother said, "It is because he has by now accustomed himself to the appearance of your white face."

* * *

Who says refresher courses are mostly a waste of time? The members may spend a good deal of time sightseeing, but they learn to call it "observation visits."

Letters to the Editor

ATHEROSCLEROSIS: POSSIBLE ILL-EFFECTS OF THE USE OF HIGHLY UNSATURATED FATS TO LOWER SERUM-CHOLESTEROL LEVELS

SIR,—Substitution of vegetable and marine fats for animal fats in the diet of humans may be accompanied by a lowering of serum-cholesterol levels. It is believed that this effect is related to the fact that vegetable and marine oils are more unsaturated than animal fats.[1,2] This effect has been noted in rabbits, and the lowered serum-cholesterol levels were correlated with a lesser degree of atherosclerosis at the end of the experiment.[3]

At present there is an increasing interest in the clinical use of such unsaturated acids as linoleic acid to lower serum-cholesterol levels, and thus presumably to slow down the rate of progression of atherosclerosis. Unfortunately, the use of highly unsaturated fats in the diet may lead to side-effects that would outweigh any benefit they have in atherosclerosis.

In general, the more unsaturated a fat is, the more readily is it oxidised—peroxides and compounds of higher molecular weight are among the products.[4] Thus, increasing the degree of unsaturation of dietary fats—particularly of those containing two or more double bonds—will increase the intake of fat oxidation products.

In rats oxidised dietary fats produced gastric ulcers,[5] and even gastric carcinomas.[6] In Japan, carcinoma of the stomach is the leading cause of death from cancer.[7] Is this related to the fact that fish, which is rich in unsaturated fat, is an important part of the Japanese diet? Similarly, in Sweden, another country with a high consumption of fish, the death-rate of white males from gastric carcinoma in the age-range 55–64 is two to three times as high as it is among the comparable population in the United States—and this in spite of the fact that the death-rate in the 55–64 age-group in Sweden is less than in the United States.[8]

Highly oxidised hog fat added to the diet of rats caused a weight-loss that could be explained neither by lack of unsaturated acids nor by lessened food intake. The degree of weight-loss was parallel to the degree of oxidation of the fat.[9] In another study the toxicity of highly unsaturated fatty acids was found to be due to the peroxide present; the peroxide was found in liver and muscle fats when the oxidised fats were fed.[10]

In in-vitro studies, the number of metachondria separated from rat livers was decreased when oxidised fatty acids were added to the metachondria solution.[10] Ethyl oleate peroxide has been shown to oxidise slowly the mercaptan groups of proteins, first to disulphide, then, with an excess, irreversibly to a higher state of oxidation.[11] Oxidised fatty acids have been shown to have an adverse effect on a number of oxidative enzymes.[12]

Unsaturated fatty acids increase the body's demand for vitamin E.[13] This may be the result of an increased susceptibility to oxidation of the fat stores in individuals on a diet rich in unsaturated fat diet, as indicated by an experiment[14] in which cod-liver oil was fed to pigs—the fat laid down was abnormally susceptible to oxidation.

1. Malmros, H., Wigand, G. *Lancet*, July 6, 1957, p. 1.
2. Ahrens, E. H., Jr., Insull, W., Jr., Blomstrand, R., Hirsch, J., Tsaltas, T. T., Petersen, M. L. *ibid.* 1957, i, 943.
3. Kritchevsky, D., Meyer, A. W., Tesar, W. C., Logan, J. B., Baron, R. H., Davier, N. C., Cox, H. R. *Amer. J. Physiol.* 1954, **178**, 30.
4. Holman, R. T., Lundberg, W. D., Malkin, T. Progress in the Chemistry of Fats and Other Lipids; vol. 2. London, 1954.
5. Morris, H. P. Biological Antioxidants. Transactions of the Second Conference, Josiah Macy, Jr., Foundation; p. 96. New York, 1947.
6. Roffo, A. H. *Bol. Inst. med. exp. Cancer, B. Aires*, 1939, **15**, 407.
7. Takeda, K. *Gann*, 1955, **46**, suppl.
8. Calculated from the vital statistics for the United States, 1949–51, and for Sweden, 1951.
9. Kaunitz, H. *Arch. exp. Path. Pharmak.* 1953, **220**, 16.
10. Kanedi, T., Sakai, H., Ishi, S. *J. Biochem., Tokyo*, 1955, **42**, 561.
11. Duboulog, P., Fondarai, J. *Bull. soc. Chim. biol., Paris*, 1953, **35**, 819.
12. Bernheim, F., Wilbur, K. M., Kenastan, C. B. *Arch. Biochem. Biophys.* 1952, **38**, 177.
13. *Annu. Rev. Med.* 1953, **4**, 157.
14. Lea, C. H. *Rep. Fd Invest. Bd, Lond.* 1936, **73**, 5.

Thus, even though dietary unsaturated fats such as linoleic acid are free of oxidation products, they would be expected to have an adverse effect on the organism.

The deleterious action of fatty acid peroxides on the body is probably related to the fact that they are strong oxidising agents; many important enzymes and vitamins are easily oxidised.[15] In the course of the action of an organic peroxide on a reducing agent, peroxy (RO) and hydroxy (HO) radicals may be produced. The mutagenic and carcinogenic actions of X rays are attributed to the formation of HO and HO_2 radicals, and recently it has been suggested that spontaneous cancer arises through the side-effects of HO and HO_2 radicals produced in the normal course of metabolism.[16] Thus the production of gastric carcinoma by oxidised fats, as observed by Roffo, is not too surprising.

Further, one of the initiating steps in atherosclerosis may be the oxidative polymerisation of some of the constituents of the lipoproteins.[17] If this is true, an increase in the degree of unsaturation of the dietary fats may, over a long term, actually increase the severity of atherosclerosis.

For these experimental and theoretical reasons, it is urged that the present enthusiasm for increasing the degree of unsaturation of dietary fats (to combat atherosclerosis) be curbed, pending additional study of the possible adverse effects of this dietary change, lest the "cure be worse than the disease."

Veterans Administration Hospital, San Francisco, California. DENHAM HARMAN.

CORONARY-ARTERY DISEASE—A POSSIBLE PATHOGENESIS

SIR,—The findings of our group have led us to conclude that vascular injuries, and the healing thereof, probably play a more important role in the pathogenesis of vascular sclerosis than has been generally accepted. Sclerosis seems to follow two main types of injury to vessels:

1. Acute *single* insults (metabolic and/or physical).
2. Alterations in blood-vessels during rapid vascular growth, and the accompanying *remodelling* of the blood-vessels, especially between the ages of 8 and 20 years—the period of maximal increment in both body length and organ growth in man.[18]

Experimental Vascular Injuries

These suggestions are based on our findings in experiments on rats.

In the first series rats were initially fed, for a single period of five consecutive days only, toxic doses of calciferol, which are known to inflict severe vascular lesions.[19–23] A *single* acute and transient injury, of sufficient severity, may produce, in coronary and other arteries, *repair* as opposed to *regeneration*, with resulting intramural scar formations (fig. 1). The histogenesis of such scars is comparable in many respects with that of scars following deep cutaneous injuries,[23–26] but they take much longer to develop and even longer to contract. Nevertheless, if the injury is severe enough, such intramural scars regularly form, especially in medium-sized vessels. Coronary sclerosis and tortuosity may thus be produced, and, on contracture, stenosis and even thrombosis of the coronary lumina may result (fig. 1*d*). These lesions are easily and regularly reproducible in both male and female adult rats by large doses of calciferol.

These findings clearly show that at least one form of experimental coronary disease may be the sequel of a *single acute lesion*, affecting particularly the *media*. Comparable medial damage in man may perhaps result from metabolic disorders, strenuous physical effort, or derangements in the normal remodelling of the arteries during the period of active vascular growth between the ages of 10 and 25 years, especially as medial damage is also common in the coronary arteries of man.[27–29] Consequently the intima and media of human arteries often show that degenerative change which we have previously termed "pseudoelastic tissue" or "elastotic degeneration" of collagen.[23 27 29]

In our calciferol-treated rats *medial* scarring was of primary importance in the production of coronary sclerosis, stenosis, and thrombosis. But, as our second series of experiments shows, the normal process of vascular remodelling, essential during growth, at least of the rat's aorta, seems initially to involve lysis of the innermost elastic membranes (fig. 2), new membranes apparently being formed simultaneously toward the periphery of the vessels. Such vascular remodelling may make the intima more susceptible to fibrin deposite; scarring appears only later (fig. 3). In these other experiments we fed sweet-pea seeds to rats.

These seeds contain β-amino-propionitrile, which produces severe vascular injuries.[30 31] We found, as did Ponseti,[32] that the incidence and speed of production of aortic ruptures and aneurysms is far greater when the toxin is fed to very young rats than when it is fed to older ones. This action seems to be related directly to the growth and remodelling of the aorta, being greatest during the first twenty-five to thirty days of life, when aortic growth is most rapid.[33] Intoxication is detectable by rupture of the innermost elastic membranes (fig. 2), usually preceded by intermembranous accumulations of muco-polysaccharides in the aortic subintimal and medial regions.[34] We suggest that this rupture of subintimal membranes, and of the aorta itself, is due to some derangement in the normal balance between lysis and regeneration of the membranes, though others attribute them solely to elastolysis.[30 31]

These studies with sweet-pea seeds support our contention that the integrity of the collagen-like "cores" of the vascular elastic membranes may depend on their "sleeves" of reticulin and polysaccharides.[23 35] If intoxication is not continued long enough to produce rupture of the aorta, fibrosis and scarring of both intima and media may supervene in large vessels, often with heavy mucopolysaccharide accumulations and ensuing aneurysm formation (fig. 2), while stenosis results from damage to smaller vessels, especially in the lungs. The coronary arteries seem relatively immune to the toxic action of β-amino-propionitrile.

It seems that elastic membranes (whether in the skin or in the walls of arteries) do not easily regenerate after rupture, whatever the cause, but are usually replaced by scar tissue.[23–26 35] We therefore think it possible that acute traumatic or long-continued toxic or metabolic injuries of the vascular elastic membranes, especially during critical stages of growth, may perhaps predispose to vascular sclerosis, stenosis, and related lesions many years later in life.

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17. Harman, D. *ibid.* 1957, **12**, 199.
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19. Ham, A. W. *Arch. Path.* (*Lab. Med.*), 1932, **14**, 613.
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24. Gillman, T., Penn, J., Bronks, D., Roux, M. *Brit. J. Surg.* 1955, **43**, 141.
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27. Gillman, T., Penn, J., Bronks, D., Roux, M. *Arch. Path.* (*Lab. Med.*), 1955, **59**, 733.
28. Moschcowitz, E. Biology of Disease; p. 18. New York, 1948.
29. Levene, C. I. *J. Path. Bact.* 1956, **72**, 59.
30. Bachuber, T. E., Lalich, J. J. *Arch. Path.* (*Lab. Med.*), 1955, **59**, 247.
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32. Ponseti, I. V. *J. Bone Jt Surg.* 1954, **36A**, 1031.
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34. Menzies, D. W., Mills, K. W. *J. Path. Bact.* 1957, **73**, 223.
35. Crawford, T. *ibid.* 1956, **72**, 547.

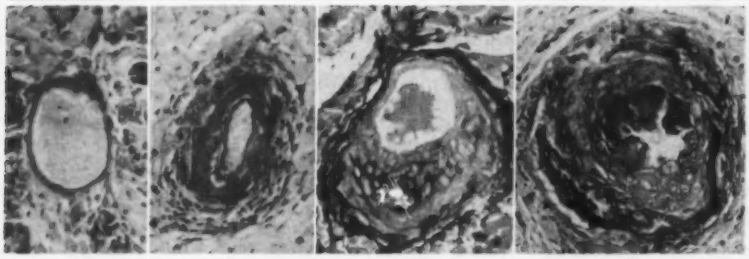

Fig. 1—Rat coronary arteries: *a*, 6 days after calciferol, showing dilatation, loss of waviness, thickening and intense periodic-acid Schiff staining of elastic membrane. Periodic-acid Schiff haematoxylin. *b*, 43 days after calciferol; thickening, straightening, and intense periodic-acid Schiff staining, homogenous internal elastic lamina, cellularity of media and adventitia and some endothelial swelling. Mucopolysaccharide in both media and adventitia. Alcoholic toluidine blue. *c*, 200 days after calciferol; lumen still dilated, medial and early intimal cellularity, early increase in intercellular medial reticulin with distinct perivascular reticulin and collagen increase. Wilder silver method with Van Gieson counterstain. *d*, 188 days after calciferol; medial and perivascular cellularity with sclerosis and persistent excess of periodic-acid Schiff staining polysaccharide scattered in media (remnants of internal elastic membrane); intimal thrombus with (localised) luminal narrowing. Periodic-acid Schiff.

findings confirm Greig's,[38] and also extend them in emphasising the importance of sexually determined peculiarities of metabolism, which may be significant in view of the known higher incidence of coronary deaths in young men.

If fibrin deposits in vessels are, at least in part, a function of the balance between the fibrinolytic activity and fibrin content of the plasma,[39 40] then the order of liability to progressive *intimal* thickening and ultimate coronary occlusion would probably be as follows: male castrates, normal males, female castrates, normal females. This possibility is supported further by our preliminary finding concerning changes in plasma fibrin and fibrinolytic activity in normal and castrated males fifty-one days after the induction of vascular damage by calciferol. Fibrin content rose markedly in both these latter groups, but fibrinolytic activity remained unchanged in the "normals" and fell profoundly in the castrates.

Prophylactic testosterone treatment of castrates seemed to prevent both the drop in fibrinolytic activity and the rise in plasma-fibrin seen after calciferol-induced injury in normal and castrate males.

The sexual variations in fibrinolytic capacity may perhaps be related to sexual variations in tissue mast-cells,[41] plasma-hyaluronidase,[42] or blood-heparinoids.[43] The mechanisms promoting sexual differences in fibrin content, and the mode of operation of sex hormones in modifying plasma fibrin and fibrinolytic activity, are also being investigated in our laboratories.

Fibrinolysis, Sex Hormones, and Fat Intake

Nevertheless, human beings, or rats, with tortuous, sclerosed, stenosed, and even partially thrombosed coronary arteries may live for many months without acute coronary failure.

In our initial experiments with calciferol, we found that if, five to six months after the initial insults, the rats were fed a diet relatively rich in fats, the females survived but the males all died within a fortnight, always at night (the time of greatest food-intake and activity for the rat) and without any preceding clinical signs of illness or any necropsy evidence of cardiac infarction. Control males with equal injury, but maintained on the stock diet, survived until killed several months later.

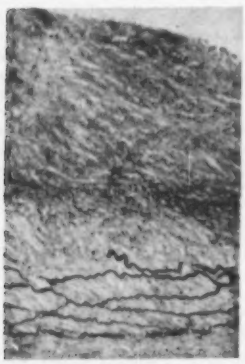

Fig. 2—Rat ascending aorta after consuming lathyrus seeds for 58 days. The dark-staining intermembranous material represents accumulations of polysaccharide. Rupture of immediately subintimal elastic membrane and related polysaccharide accumulation. Rinehart Abul-Haj.

We formed the hypothesis that death might have been due to a sudden fall in the fibrinolytic capacity of the plasma, perhaps induced by lipæmia, with subsequent acute, albeit transient, occlusion of the damaged coronary arteries by the deposition of fibrin threads, especially since endarterial thickenings and even mural thrombi were detected microscopically, particularly in males. Survival of females, we thought, might have been due to their better ability to handle fat and to regulate fibrin precipitation.

Though we have *not* yet proved this possibility we *have* shown that the fibrin content and fibrinolytic capacity of the plasma were greater in male than in female rats. After gonadectomy the fibrinolytic activity in the males decreased and the fibrin content in the females increased.[36]

Three hours after a fatty meal, the chylomicronæmia was greater in males than in females—a finding which could be expected to increase still further the likelihood of intra-arterial fibrin deposition.[37] These

36. Gillman, T., Naidoo, S. S. *Endocrinology*, 1958 (in the press).
37. Cullen, C. F., Swank, R. L. *Circulation*, 1954, **9**, 335.

Comment

Duguid[44 45] accounts for the sclerosis of arteries, mural thrombi, and intimal fibrin depositions essentially on the basis of *intimal* reactions; but our experimental studies in rats, our histological findings in patients, and the work of others on human coronary vascular lesions, lead us to suggest that *medial* lesions may be

38. Greig, H. B. W. *Lancet*, 1956, ii, 16.
39. Mole, R. H. *J. Path. Bact.* 1948, **60**, 413.
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44. Duguid, J. B. *Lancet*, 1954, i, 891.
45. Duguid, J. B. *Brit. med. Bull.* 1955, **11**, 36.

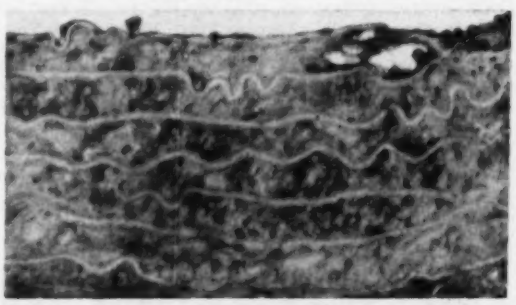

Fig. 3—Rat aortic arch, after consuming lathyrus seeds for 172 days. Remains of irregular, straightened, and irregularly ruptured medical vascular elastic membranes, with broad overlying mucopolysaccharide. Cell-laden intimal scar and adventitial sclerosis—both consequences of the medial lesions. Orcein haematoxylin.

more common as precursors of intimal damage than is maintained by Duguid. After severe damage, medial repair may result in vascular "scarring" or perhaps in "elastotic degeneration," with consequent loss of that elasticity which is probably far more a function of the state of the medial musculature and elastic tissue than of the intima. Contracture of such medial scars may promote vascular stenosis in medium and smaller arteries, whereas aneurysmal dilatation may perhaps follow medial degeneration in larger "high-pressure" arteries. Once these medial lesions supervene, the rigidity and/or stenosis of the affected vessels may increase their susceptibility to intimal lesions in the manner described by Duguid.

Sexual differences in the rate and manner of disposal of ingested fat, in the amount of circulating fibrin and fibrinolysin, and especially in the effects of fat ingestion on plasma fibrinolytic capacity, together with the synchronous red-blood-cell agglutination and circulatory stasis ensuing on fat ingestion,[37] may then favour coronary intimal fibrin deposits or mural thrombi, perhaps especially in the previously sclerosed arteries in males. Intimal sclerosis, in turn, may aggravate the loss of elastic and muscular components from the arterial walls even though dilatation supervenes as the inelastic scar tissue stretches with time.

Perhaps, in the light of the above facts and theories, modern knowledge of wound healing, of the acute and chronic metabolic effects of dietary fat, and of the actions of sex hormones, may be fitted into this single concept of the pathogenesis of acute and chronic coronary and other arterial lesions.

The concept here outlined is supported not only by the above experimental facts, but also by our finding of unduly elevated fibrinolytic activity in the plasma of African males,[46] among whom coronary deaths are rare though the incidence of coronary pathology is not unduly decreased.[46–48] The inadequate low-fat diet of the African male may perhaps protect him against coronary occlusion in two ways: (1) he is probably less likely to suffer the untoward effects of repeated depressions of his plasma fibrinolytic capacity than is the European who regularly consumes more fat with each meal; and (2) the high incidence of liver disease and of other nutritionally conditioned metabolic disorders, by promoting the common "feminisation" (gynæcomastia, testicular atrophy, and other evidence of deranged androgen-œstrogen balance [46–48]) may perhaps also protect him in some manner comparable with that found in our normal, castrated, and hormone-treated rats.

Moreover, in view of the effects of the pancreas on fat absorption, and in view of the suggested actions on arterial elastic tissue and on mucopolysaccharide metabolism of the pancreatic enzyme elastase,[49–51] and of the prevalence of coronary-artery disease in diabetes, we are also investigating the plasma-fibrin and fibrinolytic capacity and responses to fat in European diabetic patients.

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46. Gillman, T., Naidoo, S. S., Hathorn, M. *Lancet*, Oct. 5, 1957, p. 696.
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49. Banga, I., Balo, J., Szabo, D. *J. Gerontol.* 1956, **11**, 242.
50. Lansing, A. I., in Symposium on Atherosclerosis, National Academy of Sciences; p. 50. National Research Council, Washington, D.C., 1955.
51. Saxl, H. *Gerontologia*, 1957, **1**, 142.

ATHEROSCLEROSIS IN A HÆMOPHILIAC

SIR,—The case-report of atherosclerosis in a hæmophiliac by Dr. Stewart and Dr. Acheson [1] and the comment on arteriosclerosis and hæmophilia by Dr. Astrup [2] are of considerable interest, particularly since they are concerned with Duguid's concept [3] of intimal thrombosis as the cause of atheroma, which I discussed recently.[4] I believe that the apparent discrepancy between the observations of Stewart and Acheson and Duguid's concept may be explained otherwise than as suggested by Astrup. Accordingly, the following remarks are intended both to help the problems in question, and to serve as a guide for future research on hæmophilia and atherosclerosis.

In dealing first with what Astrup calls the "dynamic balance between fibrin deposition and fibrinolysis," it seems that this proposed balance resembles my own concept of a homœostatic equilibrium between fibrin deposition and fibrinolysis on the endothelial lining of the vessel wall.[4 5] Throughout life, a fibrin film of submicroscopic dimensions is constantly formed, deposited, and renewed on the endothelium, and the "dynamic balance" acts in *maintaining* a fibrin layer, whereas, according to Astrup,[6] its action abolishes this layer whenever and as soon as it is formed. Thus, in Astrup's view, fibrinolysis in healthy subjects removes the fibrin clot which may form when an injury to the arterial wall permits the entrance of tissue thromboplastin. In my view, fibrin precipitation takes place all the time and is present in hæmophiliacs as well, without the vessel walls being necessarily injured. The fundamental difference lies in a new physiological role of fibrin formation covering the endothelium, while, in Astrup's view, such a role does not exist. The question then arises, how may thrombi form in hæmophiliacs, and then, as suggested by Duguid, become the basis for atheromatous lesions? As in normal subjects,[7] such thrombi may be explained in two different ways:

1. By the main feature of the concept of the endo-endothelial fibrin film. Since the thickness of this film is controlled by continuous fibrinolysis and continuous fibrin formation and deposition,[8] thrombus will form if there is, in any part of the circulatory system, hyperproduction and hyperdeposition and/or hypofibrinolysis.

2. By the postulation of the third or gelation phase of blood-coagulation, which differs from the second or fibrin-precipitation phase.[7 8] In a hæmophiliac, a blood gel may form at the site of injury of a vessel wall owing to the seepage of tissue juice containing both thromboplastin and geloplastin,[9] a substance needed to promote blood gelation.

In hæmophilia, it can be readily shown by the thromboplastin-generation test [10] that plasma-thromboplastin is deficient. This deficiency in plasma may apply not only to thromboplastin, but as well to geloplastin—a problem which needs to be examined. I concur with Astrup that the lack of thromboplastin in hæmophilic blood is being compensated for by the tissue-thromboplastin at the site of injury, thus activating thrombin. But the fact that hæmophilic blood forms fibrin gels only long after fibrin has precipitated [8] suggests that the coagulation disturbance in hæmophilia may depend mainly on a geloplastin deficiency or on a relative antigeloplastic action.

The clinical observation of Stewart and Acheson, that, in their case, a firm thrombus could not have been formed

1. Stewart, J. W., Acheson, E. D. *Lancet*, 1957, i, 1121.
2. Astrup, T. *ibid.* Oct. 12, 1957, p. 745.
3. Duguid, J. B. *ibid.* 1954, i, 891.
4. Copley, A. L. *ibid.* 1957, i, 102.
5. Copley, A. L. Abstracts of Communications to the 19th International Physiological Congress. Montreal, 1953; p. 280; *Arch. int. Pharmacodyn.* 1954, **99**, 426.
6. Astrup, T. *Lancet*, 1956, ii, 565.
7. Copley, A. L. *Ärztl. Forsch.* 1957, **11**, I/114.
8. Copley, A. L. *Ann. N.Y. Acad. Sci.* 1948, **49**, 500.
9. Copley, A. L. *Rev. belg. Path.* 1955, **24**, 128.
10. Biggs, R., Macfarlane, R. G. Human Blood Coagulation and Its Disorders. Oxford, 1957.

in bleeding vessels, is borne out by our earlier experiments [11] in which the firmness of retracted hæmophilic-blood gels was found to be extremely low. We found in hæmophiliacs that, though the bleeding-time (a value which estimates initiation of hæmostasis) is normal, the clot or wound thrombus resistance (a test which estimates the maintenance of hæmostasis) is low.[12] Also of interest is the authors' statement that the immediate cause of death was hæmorrhage for which "no local cause was found." This hæmorrhage may have been due either to injury to a larger blood-vessel or to the disturbance in the balance related to the endo-endothelial fibrin film, possibly caused by local hyperfibrinolysis. It appears that the problem of fibrinolysis in hæmophilia has not been adequately studied. I should like to raise this point, particularly because of purpuric manifestations shown by bruises in this case. Although these manifestations are, in general, not held to be typical in hæmophilia, they have been described in many cases. Many authors have thought of a vascular factor playing a role in hæmophilia.[10] These purpuric manifestations can be explained by two major processes: the above-cited one related to the endo-endothelial film, and a disturbance in the maintenance of hæmostasis due to soft wound thrombi and possibly some defect in the adherence of such thrombi to injured capillary vessel walls.

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LIPOPROTEIN PATTERNS IN MYOCARDIAL INFARCTION

SIR,—Dr. Smith (Nov. 9) says that the β-lipoprotein in human sera is rarely decreased below the normal level.

I have stained routine electrophoretic strips for lipoprotein for about two years and have examined them in over 2000 cases. β-lipoproteins are diminished in severe sepsis, some cases of steatorrhœa, the newborn, cord blood at delivery, and some cases of myelomatosis and neoplasm.

β-lipoproteins are virtually absent from miscellaneous body-fluids, including urine, pleural fluids, ascitic fluids, joint effusions, and cerebrospinal fluid.

The demonstration of β-lipoproteins by staining is dependent on using fresh serum. If serum is stored, lipoproteins advance towards α_2 and may therefore be described as pre-β.

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NOMEN PROPRIUM

SIR,—The Association of Teaching Hospital Pharmacists, comprising the chief pharmacists of the undergraduate teaching hospitals of England and Wales, has discussed in recent meetings the growing practice by prescribers of disclosing to patients the identity of prescribed medicines. Correspondence on this subject has appeared from time to time in the columns of the medical and pharmaceutical press, in which the points in favour of this practice have been advanced. It is realised that in some instances there are no objections—indeed, there may be advantages to be gained—but this Association believes that if it is used indiscriminately there are also disadvantages and risks which should be recognised.

A dispensed medicine is intended for the use of the patient for whom it is prescribed for a definite period of time, and by disclosing its identity on the label, these objects may well be defeated. Once the name of a drug is known to a patient, further supplies (other than certain poisons and substances controlled by law) may be obtained indefinitely by direct purchase without further reference to the prescriber. Not only may the patient indulge in self-medication, he may also recommend the drug to others presenting "similar" symptoms. Recently, leaflets giving details of clinical uses, contraindications, and the technique of laboratory control of dosage of a drug have come into the hands of patients to the embarrassment of the physician concerned. Such leaflets may be included in the original containers of drugs acquired by direct purchase.

Present-day patients are reputed frequently to demand a particular drug or preparation from their physicians. This method of labelling will surely increase the frequency of these demands and in certain instances it may be an indication of the disease being treated. Further, the use of this method as an "aide-memoire" in repeating prescriptions is not one which this Association would advocate when other proper systems of recording patients' treatments are available.

Perhaps the most serious risk is the use of a drug left over from a previous occasion which has been stored long after its useful life in the household medicine cupboard. The anonymity of a dispensed drug is the one factor which makes it unlikely to be used by sensible patients at a later date. A named drug is more likely to be so used and will be assumed to be active and safe. It may be neither. On prolonged storage in unsuitable conditions a drug may become inert or, more rarely, toxic. Further risks arise with supplies of drugs of different strengths or with similar names which may be mixed by the patient and subsequently used.

For these reasons we believe that the name of a drug prescribed for patients should not be disclosed routinely and that the initiative remains with the prescriber as a matter of individual decision. If it is decided to let the patient know the name of the drug with which he is being treated, the prescription should be maked "N.P." (*nomen proprium*), and the pharmacist will then label the drug by name. Without such instruction, the pharmacist will continue to maintain the secrecy which we believe he has always done in the past.

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CEREBRAL ŒDEMA

SIR,—Dr. Raison (Nov. 16) writes:

"The value of anticipating and treating cerebral œdema following hypoxia was shown clearly. . . . Tracheotomy enabled the patient to be nursed sitting up while unconscious, and remarkable improvement followed the adoption of this posture."

Dr. Bourne (Sept. 14) seems to condemn the upright position for cerebral hypoxia, and many seem to agree with him (Sept. 21).

According to Sir Russell Brain (Nov. 2),

"There is little evidence that either vasoconstrictor or vasodilator drugs in pharmacopœial doses have any effect on the cerebral blood-vessels in man. . . . The cerebral vessels, however, are dilated by the usual products of metabolism (decreased oxygen, increased carbon dioxide, increased acidity, and increased temperature)."

Is it not reasonable to suppose that—as in the case of the rabbit—the upright position may favour constriction of the cerebral arteries and so reduce blood-flow, while simultaneously favouring drainage through the great veins of the brain, the algebraic sum of these effects tending to counter the effects of anoxia and incipient œdema?

This explanation is supported by the work of Ransome et al.[1 2] who were dealing with cases of cerebral malaria

11. Lalich, J. J., Copley, A. L. *Proc. Soc. exp. Biol., N.Y.* 1942, **51**, 232.
12. Copley, A. L., Lalich, J. J. *Amer. J. med. Sci.* 1942, **204**, 665.

1. Ransome, G. A., Gupta, L. M., Paterson, J. C. S. *Brit. med. J.* 1944, ii, 584.
2. Ransome, G. A., Paterson, J. C. S., Gupta, L. M. *ibid.* 1945, i, 659.

and heat-stroke. I also recommended the nursing of unconscious men in the upright position in heat-stroke.[3] Courville[4] emphasises the dangers of hypoxia with many examples. In men with heat-stroke, unconscious, and with rectal temperatures in the region of 109°F, nursing in the upright position (which can easily be arranged with plenty of pillows) and oxygen inhalations through a B.L.B. mask often proved life-saving.

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FRANK MARSH.

EARLY ADMISSION TO HOSPITAL OF MENTALLY DEFECTIVE BABIES

SIR,—I read with interest Miss Adams' excellent letter of Nov. 9, criticising ill-advised suggestions that mentally retarded children should be admitted to hospital immediately the diagnosis is made. There are two comments that I wish to make, one in support and one in explanation.

Firstly, in my opinion, the admission of a mentally defective patient to hospital should be deferred for as long as is reasonably possible, taking into account, of course, such factors as home conditions, availability of training, effect of his presence on other members of the family, and individual needs of the patient.

Secondly, the reason for most doctors' ill-advised comments and guidance is quite clearly their inadequate training in mental deficiency as medical students. Although specialists are prone to suggest that medical students require more training prior to qualification, in their particular speciality, I am not suggesting that this is necessary.

It is, however, apparent that the education given to medical students on mental deficiency incorrectly emphasises two facets of the problem—the diagnosis of amentia and the function of mental-deficiency hospitals. More important aspects, such as social implications, schools for the educationally subnormal, and various forms of community care, are completely ignored. Medical students, therefore, know too little about the subject to be able to offer any concrete advice after qualifying. They are also inclined to carry their general medical attitude into mental deficiency—i.e., after diagnosis, treatment—and since the only treatment they may know is admission to hospital, this is immediately recommended. Until it is made clear to doctors, welfare workers, and in particular medical students that there is more to the care, training, and rehabilitation of mentally retarded patients than certification and admission to hospital, little progress will be made in this specialised branch of psychiatry.

Other complications also arise. Because their knowledge is inadequate, medical students are not likely to be attracted to the work, and the poorer the quality of candidates, the slower the advances in this field. This slow progress will continue to deter doctors from specialising in this aspect of psychiatry. For those who may doubt the poverty of recruits, study of the medical staff of mental-deficiency hospitals will prove that there is an undue proportion of relatively aged, poorly qualified doctors, and many establishments are bolstered by large numbers of locum tenentes. A more telling criticism is that an excessive proportion of articles on the subject and its progress are initiated by psychologists and social workers, rather than by psychiatrists.

Until enlightened and intelligent members of the community become more sympathetic and knowledgeable towards mental deficiency, the attitude of the general public is unlikely to improve.

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E. W. SHEPHERD.

3. Marsh, F., British Encyclopædia of Medical Practice. Interim supplement, 1945, 34, 9.
4. Courville, C. S. Untoward Effects of Nitrous Oxide Anæsthesia; p. 159. Mountain View, Cal. 1939.

SIR,—May I support the comment by Dr. Vulliamy in your issue of Nov. 16. I am, as an almoner, much in sympathy with Miss Adams' view (Nov. 9), but feel perhaps that her experience is unfortunate rather than representative. Looking down a twenty years' perspective as an almoner working with pædiatricians, I find only comfort and reassurance that these children are increasingly referred to them.

The exact method and time at which this intolerable information should be given to parents must vary in some degree in almost every case. In my experience the searching and troubled questions of the parents form the basis upon which most pædiatricians gradually make the extent of the child's disability understood. This gradual, sustained advice usually continues most compassionately to be given throughout the following years of childhood.

It is not chance, I suggest, that Miss Adams' examples are both concerned with children suffering the mongolian type of mental deficiency. Hospital doctors are aware of the growing public interest and facile knowledge of these matters and they must, with mongol babies, always consider the danger of some well-meaning outsider telling parents who are wholly unprepared.

Referring to Miss Adams' comments about institutional care, it is well, I suggest, that parents should know immediately that institutional provision does exist. In their grief they tend to merge this information with their own ability to accept or reject their handicapped child, and they will often think that they have been given definite advice for baby's care away from home when this is, in fact, not the case. In my experience the knowledge that such help does exist assists them to accept the care of the child with a more quiet courage. They meet the day-to-day problem with a knowledge that if their situation does become intolerable they can appeal for this kind of help.

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London, W.2.

E. E. SUMPTER.

SIR,—I have been following this correspondence with interest and with a growing surprise that—unless I have overlooked it—there has been little or no reference to a section of the profession which is very intimately concerned with the problem of mental deficiency. I refer, of course, to school medical officers, particularly those engaged in the actual ascertainment of cases from the age of two years upwards. These doctors are, I suppose, not very vocal and burst into print only about once a year as a rule; accordingly the importance of their labours may sometimes be overlooked in certain quarters, and silence once described bitterly as the "virtue of fools" may lead to misapprehension: in my case it might have been further preserved but for the statement by Dr. Leys (Nov. 23) that "To know the abnormal one must very often compare the abnormal with the normal and the only doctors in a position to do this are general practitioners and pædiatricians."

I can assure Dr. Leys that the school doctor who has to make decisions in the difficult cases of abnormality that are brought before him is by no means unaware of the normal and that though he is considerably helped by the reports of the pædiatrician, the comments of the general practitioner and the health visitor, and the tests of the psychologist, it is the school doctor himself who has to correlate all these findings and in the light of his own knowledge and experience take the responsibility of making the final diagnosis. Looking back over many years my impression is that mistakes are few.

To my mind the presence of a mentally defective child in a family demonstrates one of the great human tragedies, and I should like to assure Miss Adams (Nov. 9) that in at least one large area (and I cannot believe that attitudes are not similar elsewhere) every effort is made to soften the blow to the parents, to enable them to understand

the situation and to face it without depriving them of hope, and at the same time to do the best possible for the child.

Many of us who have been cheered in recent years by the more human approach to the whole subject find new hope in the latest developments in therapy. In phenylketonuria, for example, the prospects of improvement can be definite if diagnosis is early enough, and I have been pleased to see emphasised in Hilliard and Kirman's *Mental Deficiency*, recently published, the prospects of treatment in other conditions which have been previously regarded as more or less hopeless.

Birmingham. P. R. KEMP.

INFLUENZAL PNEUMONIA TREATED WITH CORTISONE AND ANTIBIOTICS

SIR,—Our answers to the questions and comments by Dr. Rose (Nov. 2) and Dr. Rotem (Nov. 9) are as follows :

Our patients with influenzal pneumonia were 3 men (aged 22, 33, and 65) and 4 women (aged 18, 38, 58, and 82). The man of 65 and the woman of 82 had arteriosclerosis and left ventricular failure, and the woman also had diabetes. The diseases of the younger patients included tuberculosis, cirrhosis, and hepatitis.

The pathogenic bacteria were pneumococcus (3), streptococcus (3), and *Staphylococcus aureus* (1). All the organisms were very sensitive to the antibiotics used. 3 of the patients were treated with prednisone (20 mg. daily) with the same good results as with cortisone.

We think that in every case of severe bilateral pneumonia with heart-failure, pulmonary œdema, or myocarditis, intramuscular prednisone can be used without danger. The same treatment can be used in every severely ill patient with extensive acute pulmonary involvement, rapid respiration-rate, and low blood-pressure. We have no experience in the use of intravenous hydrocortisone in these cases, but we think it may be best in the treatment of severely ill patients.

Our work was presented to the Medical Society of Santiago on Sept. 27, and will be published in the *Revista Medica de Chile* this year.

Department of Medicine. Aguirre Hospital, University of Chile, Santiago. M. PLAZA DE LOS REYES R. CRUZ-COKE.

IMPORTANCE OF THE ILEUM IN THE ABSORPTION OF VITAMIN B_{12}

SIR,—Dr. Girdwood and Dr. Doig (Nov. 22) disagree with our statement that vitamin B_{12} is not absorbed in the proximal small intestine of rats and consider that our data support their view that B_{12} is absorbed from the upper intestine. As the significance of our results has been misunderstood, we should be grateful if we might summarise our original findings [1] and those of subsequent experiments.

(1) When vitamin B_{12} is absorbed through the agency of intrinsic factor in the rat, there is a delay of 1 hour before B_{12} appears in the blood.

(2) If normal rats are killed 1 hour after oral doses of 0·0025 to 0·1 μg. of ^{58}Co-labelled B_{12}, radioactivity is present in the intestinal wall but there is no significant radioactivity in other tissues. The total amount of ^{58}Co-B_{12} absorbed from a single dose is found in the intestinal wall of rats killed at this time.

(3) In these animals, no significant radioactivity is found in the proximal one-fifth of the small intestine (upper 8 inches), an area where, in contrast, most of the absorption of inorganic iron take place in the rat. However, 85–90% of the radioactivity is found in the wall of the middle segments of the small intestine after an oral dose of 0·0025 μg. and in the wall of the middle and distal segments after larger oral doses.

For these reasons we consider that under physiological conditions vitamin B_{12} is absorbed in the middle and distal segments of the small intestine in the rat. Our reasons for suggesting that B_{12} is absorbed in the ileum in man were given in our previous letter.

Under *artificial* conditions, if unbound crystalline B_{12} is introduced directly into the small intestine of the experimental animal, or if patients with pernicious anæmia are given large doses of crystalline B_{12} by mouth, some B_{12} (1–10% of the dose) may be absorbed by simple diffusion without the need for intrinsic factor. It has been shown that under such conditions absorption may occur in the upper intestine in experimental animals [2] and the observations of Ross and his coworkers [3] suggest that "diffusion absorption" may also occur in the upper intestine in man. It may well be that the absorption observed by Dr. Girdwood and Dr. Doig in their experiments was of this nature. However, we should like to emphasise that little if any B_{12} is absorbed by the diffusion mechanism under physiological conditions.

Postgraduate Medical School, London, W.12. C. C. BOOTH D. L. MOLLIN.

1. Booth, C. C., Chanarin, I., Anderson, B. B., Mollin, D. L. *Brit. J. Haemat.* 1957, **3**, 253.
2. Rosenthal, H. L., Hampton, J. K. *J. Nutr.* 1955, **56**, 67.
3. Ross, G. I. M., Mollin, D. L., Cox, E. V., Ungley, C. C. *Blood*, 1954, **9**, 473.

COMPARISON OF CARDIAC AND PYLORIC SPHINCTERS

SIR,—I feel sure radiologists must have received a severe shock when they realised how many hours and countless ergs they had wasted trying to push barium through the pylorus, which according to Dr. Atkinson and his colleagues (Nov. 9) does not exist as a tonically contracted sphincter. If it does not, what is it that resists the bolus of barium which we so skilfully manipulate against the pyloric ring? Why is it so difficult to manipulate barium from the filled duodenal cap backwards into the stomach? Why is it that vagotomy increases such difficulties, and why is it that certain drugs relax spasm and render the examination easier?

I am well aware of the systolic contraction of the pyloric canal and have many examples of abnormal contractions, some undoubtedly reflex in origin, but I am still convinced that the sphincter itself has a function. The pylorus is a delicate structure; it responds sensitively to a sharp word or an unpleasant odour or taste, and I do not think it should be compared to a block of wood. What its reaction is to a rubber tube surrounded by four balloons might be surmised—at least by the unscientific mind—from its reluctance to show activity on the recordings.

Department of Diagnostic Radiology, General Infirmary, Leeds. A. S. JOHNSTONE.

TREATMENT OF BRONCHITIS IN PATIENTS WITH RESPIRATORY-MUSCLE PARALYSIS AFTER POLIOMYELITIS

SIR,—The number of chronic respiratory cripples disabled by poliomyelitis increases steadily, and the admirable account by Dr. Harwood Stevenson and Dr. Kinnier Wilson (Oct. 26) of the treatment of bronchitis and atelectasis in these cases will interest all those who see these patients in hospital and at home. It is perhaps useful to call attention to three very important preventive measures which can be of great help to these patients, especially when they are living at home without the help of physiotherapists, postural beds, &c.

Influenza and Cold Vaccines

The acute incidents in these patients are usually related to a "cold" or influenza, and it is obviously important to reduce the frequency and severity of intermittent respiratory infection. For the last two years we have used the combined course of influenza vaccine (types A and B) and "cold" vaccine, prepared by the Wright-Fleming Institute. The initial course is given at the end of August (3 or 4 injections at weekly intervals) and is followed by 2 booster doses in November and 2 in February. This programme seems to have two effects: colds may threaten but either they abort or they remain

"head colds" and do not spread to the chest; influenza, always a particular enemy of these cases, does not occur (this year we have of course included Asiatic influenza vaccine).

Frog Breathing [1 2]

This form of intermittent positive-pressure breathing with the muscles of the lips, tongue, and larynx can add anything up to 2 litres to the vital capacity of an adult, and correspondingly smaller amounts in children. It thus provides the respiratory cripple with an effective cough and helps to maintain the elasticity of lungs and chest wall. Its value in helping the patient to cope with secretions and so avoid atelectasis is obvious.

Avoidance of Expectorants

Doubts are often expressed on the efficacy of routine expectorant mixtures.[3] In patients with respiratory-muscle paralysis their effect is alarming. They appear to fill the patient up with copious viscous secretions and so greatly increase the risk of atelectasis. We use a combination of isoprenaline (by sublingual tablet) and 'Alevaire' (by nebuliser) to assist the removal of secretions without increasing them.

Nuffield Orthopædic Centre, Oxford. MARGARET AGERHOLM.

VALUE OF AEROSOL TRYPSIN

SIR,—May I point out an inaccuracy in Dr. Kinnier Wilson and Dr. Harwood Stevenson's letter (Nov. 16)? In referring to my paper,[4] they say that I found it necessary to give 60 ml. of inhalation per diem to achieve a reduction in sputum viscosity. Actually a reduction in sputum viscosity of roughly a third was demonstrated after an hour's inhalation of only 15 ml. The point of importance was that the reduction in viscosity was of the same order whether 'Alevaire,' sodium bicarbonate, saline, or water was used.

Department of Medicine, University of Aberdeen. K. N. V. PALMER.

PNEUMOCONIOTIC NEUROSIS

SIR,—Dr. Holt (Nov. 16) is getting lost in the thicket of his arguments. But may I hasten to state that my criticisms are directed at the terms of reference for, and not at members of, pneumoconiosis panels.

The discussion started by criticising the overemphasis on radiological appearance of lung-fields in the diagnosis of pneumoconiosis, leading to disallowance of claims for benefits in a number of cases on the basis of the preliminary X-ray examinations only. This implies that in many claims only the radiological picture of the lungs is examined, and *not* the claimant. Dr. Holt's description of the Sheffield panel's procedure exactly bears out this statement; yet he charges me with inaccuracy.

He then says "that not all rejectees are first applicants." In the Ministry of Pensions report[5] re-examinations and re-assessments are printed under separate headings. Therefore the conclusion is correct that, nationally, about 48% of all claimants for pneumoconiosis benefits have their claim disallowed on the basis of apparently negative radiological findings, though clinical examinations *after* appeal reduce this figure.

Regarding alternative employment for pneumoconiotic miners, Dr. Holt says "he is of course free to do so [change his home surroundings] if he so wishes." Dr. Holt is disregarding the catastrophic housing shortage for industrial workers, frustrating their desire to change their residence should lack of suitable employment make it advisable.

Dr. Holt thinks that miners' bronchitis and emphysema is largely caused not by their work in the pits but by their living in smoky surroundings. Acceptance of Dr. Holt's contention that the cumulative effect of polluted air outside and dust in the pit is the real cause of the pulmonary damage suffered by miners only strengthens the argument that they should receive benefits for this pulmonary disablement, in keeping with section 55 (2) of the National Insurance Act, 1946. While atmospheric pollution is a "risk common to all," exposure to coal and stone dust and the disease it causes "is such that in the absence of special circumstances, the attribution of particular cases to the nature of the employment can be established or presumed with reasonable certainty."

May I repeat my plea that the terms of reference for pneumoconiosis panels should be so amended that the diagnosis of pneumoconiosis, for the purpose of deciding industrial-disease benefit claims, should be based on the claimant's occupational history, the state of his lung function as assessed by exercise-tolerance and other tests agreed upon, the radiological appearance of his lungs, and his age and personal health record.

Batley, Yorks. H. GRUNWALD.

TREATMENT OF UNDESCENDED TESTIS

SIR,—Your leading article (Nov. 16) opens with a statement which appears to be based on inadequate and questionable evidence: "Undescended testes may enter the scrotum spontaneously at any time from infancy to manhood," implying that the natural process of descent takes place over a period of many years.

The incidence of the deformity which you quote ("more than 10%" at birth, 2% at puberty, and "as low as 0·2%" in mature men) suggests a progressive decline with advancing age. But there is reason to doubt the validity of these figures.

The authority for the figure 10% at birth can be traced to Hofstatter,[1] but evidently he has been misquoted. He examined 450 infants at full term and found that 96% (not 90%) had normally descended testes—an incidence of 4% for the deformity. I have not been able to find in the literature any study comparable to this one.

In my own investigations,[2] I examined 1500 full-term infants (5 lb. 9 oz. or more) at birth and found 51 with one or both testes undescended (3·4%). More significantly, at the end of a month the testes had descended in about half of these (Hofstatter also often noted descent in the first month). A full follow-up of all infants with undescended testes in the first 1000 of the series showed that at the age of a year the incidence had fallen to 0·7%.[3]

To say that 2% of testes remain outside the scrotum at puberty may, or may not, be true. In the recorded series of Smith[4] and Johnson,[5] who gave an incidence of 2·2% (571 boys) and 1·72% (31,609 boys) respectively, no definition was made of what constitutes a retractile testis. It is well known how very difficult the diagnosis can be at this age because of the phenomenon of retractility. McCutcheon,[6] who presumably used different criteria for assessing descent, recorded an incidence of 9·8% in 1255 boys under 15 years.

Surprisingly, an accurate determination of the incidence of the deformity in adults is not easy. Southam and Cooper,[7] after considering several series which varied between 0·2% and 0·7%, concluded that the correct figure was about 0·5%. Be that as it may, in none of the recorded series is any mention made of what constitutes an undescended testis. If a testis lies high in the scrotum, as it sometimes does, is it considered undescended or not? If an operation has been done in boyhood to bring the testis into the scrotum is it counted as undescended?

Bevan,[8] Wangensteen,[9] Grey Turner,[10] and others thought that spontaneous descent took place early in

1. Dail, C. W., Affeldt, J. E., Collier, C. R. *J. Amer. med. Ass.* 1955 **158**, 445.
2. Delleher, W. H., Parida, R. K. *Brit. med. J.* 1957, ii, 740.
3. *Lancet*, Nov. 2, 1957, p. 880.
4. Palmer, K. N. V. *Lancet*, 1957, i, 611.
5. Annual Report of the Ministry of Pensions and National Insurance. 1956. Cmd. 229.
1. Hofstatter, R. *Klin. Jb.* 1912, **26**, 155.
2. Scorer, C. G. *Arch. Dis. Childh.* 1956, **31**, 198.
3. Scorer, C. G. *Brit. J. Urol.* 1955, **27**, 374.
4. Smith, R. E. *Lancet*, 1941, i, 747.
5. Johnson, W. W. *J. Amer. med. Ass.* 1939, **113**, 25.
6. McCutcheon, A. B. *Med. J. Aust.* 1938, i, 654.
7. Southam, S. H., Cooper, E. R. A. *Lancet*, 1927, i, 805.
8. Bevan, A. D. *Ann. Surg.* 1929, **90**, 847.
9. Wangensteen, O. H. *Arch. Surg., Chicago*, 1927, **14**, 663.
10. Turner, G. G. *Proc. R. Soc. Med.* 1937, **30**, 1319.

life but very seldom, if ever, later. Much of the evidence which we possess suggests that they were right and that the incidence of undescended testis remains almost constant from infancy onwards. The discrepancies noted at present can possibly be attributed to our failure to account fully for the phenomenon of retraction and to our uncertainty as to when the testis is undescended and when it is not.

The correct treatment of undescended testis is a baffling problem which has teased many minds and which continues to elude us. There are still too many gaps in our knowledge of the natural history of descent. It may be that until we use some form of measurement to define the position of the testes, and thereby establish a criterion of what we regarded as normal, we shall make no progress.

Gerrards Cross. C. G. SCORER.

"MUNCHAUSEN'S SYNDROME"

SIR,—While we fully agree with Dr. Mac Keith that patients presenting with the Munchausen syndrome are in need of psychiatric help, we feel that this is simply not practicable in a busy medical ward.

It is unfortunate if Dr. Mac Keith feels that we have derived "mean glee" in warning others of the patient's appearance. Our motive in so doing was solely to prevent the tedious and unrewarding business of admitting the patient to hospital.

Finally, if Dr. Mac Keith will inquire further, he will find that in his own hospital's outpatient department there is a black-book containing the names and descriptions of such patients who are on no account to be admitted. (At least that was so in 1951, and it is probably still in existence.)

Whilst seeing the validity of the case for treating hysterics, we cannot see any good reason for cosseting malingerers.

Whittington Hospital, London, N.19. B. H. BASS
M. G. SELSON.

SIR,—Correspondence on Munchausen will recur, but what is surprising is the comparison with Munchausen of the type of clinical case described: they have nothing in common, Munchausen being a healthy adventurous type of liar, and I am sure he bore no wounds, certainly not of surgeon's making. Why this very military and wholly admirable character should be degraded in this way I cannot understand, nor why these miserable psychopaths should ever have been granted such a distinguished forbear.

Manchester. OLIVER JELLY.

SHORTENING AND PARALYSIS IN POLIOMYELITIS

SIR,—I have studied limb shortening after poliomyelitis in 225 children in whom paralysis was confined to one leg.[1] I cannot agree with Mr. Ring (Nov. 16) that clinical measurements from the anterior superior spine to the medial malleolus are sufficiently accurate for the recognition of differences of the order of 0·5 cm. The method of measurement of leg length is vital to this study. Nichols and Bailey[2] have shown that "the overall degree of accuracy of the clinical measurement of leg lengths is such that differences of half an inch or more may be accepted as diagnostically significant, but differences of less than half an inch are not reliable unless based on the average of at least four measurements". For this reason, radiographic measurements are essential. They were carried out wherever possible in my series.

Mr. Ring considers that limb shortening in poliomyelitis is related directly to the extent of the paralysis. I also found that the more severe the paralysis the greater the shortening, but there are notable exceptions.

(1) Patients with severe paralysis of muscles both above and below the knee may develop as little shortening as 1 in. or as much as $3^1/_2$ in.

(2) The range of shortening which may occur in patients with paralysis below the knee is the same (i.e., none to $1^3/_4$ in.) no matter whether one or all muscles are affected.

(3) It is quite impossible accurately to predict shortening. If paralysis and shortening are directly related such prediction would be possible.

1. British Orthopædic Association meeting, October, 1957; see *Lancet*, Nov. 16, 1957, p. 986.
2. Nichols, P. J. R., Bailey, N. T. J. *British med. J.* 1955, ii, 1247.

University Department of Orthopædic Surgery, The Royal Infirmary, Manchester. A. H. C. RATLIFF.

"HUNTING THE NEEDLE"

Prof. LAMBERT ROGERS writes:

"Since the appearance of my article in your issue of Oct. 19 there have been so many requests for information as to where the locator can be obtained that I am finding it difficult to deal with all of them. May I state therefore that the instrument is made by the Berman Laboratories, 112, Rockaway Boulevard, Ozone Park 20, New York, and I understand an import licence is necessary to obtain it in this country."

GENERAL PRACTICE FIFTY YEARS AGO

Dr. H. C. FAULKNER, 55, Russell Square, London, W.C.1, writes:

"I am collecting material for a book on the organisation of general practice in Britain. I should be most grateful if any of your readers who have unpublished material on the content and organisation of family doctoring in the early part of the century would be kind enough to lend it to me. I particularly require material on the work of the contract practices and other forms of local organisation of medical care before 1911. All diaries or letters of G.P.s of this period would be particularly useful. Material sent will be looked after most carefully and returned as soon as copies have been made."

Obituary

ALICE HELEN ANNE BOYLE

M.D. Brux., L.R.C.P.E.

Dr. Helen Boyle, who died at her home in Sussex on Nov. 20, the day after her 88th birthday, was a founder of the Lady Chichester Hospital for Nervous Disorders and the National Council for Mental Hygiene. These two institutions were the practical expression of her belief in the value of early treatment for patients with mental disorders and in the need for health education for the community. Their continuing success is a measure of her farsightedness, courage, and hard work.

She was born in Dublin, the daughter of Richard Boyle. She studied medicine at the London School of Medicine for Women, qualifying in 1893. After holding a resident appointment at Claybury Asylum she became medical superintendent of the Canning Town Medical Mission. Her work there showed her the need for hospital care for some patients with early mental disorder, and in 1905 she started the Lady Chichester Hospital at Hove on, as she later used to relate, "£200 and a lot of faith." She was anxious that her hospital should be associated with a general hospital, but at first the Royal Sussex County Hospital was unwilling to join forces. Slowly the Lady Chichester Hospital grew and proved its worth, particularly during the 1914–18 war when it accepted patients who had broken down as a result of war service and air-raids. During these years Dr. Boyle herself served with the Berrys' unit in Serbia and was awarded the Order of St. Sava. After the war the Lady Chichester Hospital moved to larger premises, and in 1930 the Royal Sussex County Hospital itself suggested a liaison between the hospitals, and Dr. Boyle was appointed the first woman member of the honorary staff of the Royal Sussex.

Meanwhile she had interested Sir Maurice Craig in her idea of an organisation to improve the mental health of the community. She had studied the possibility of this project during a lecture tour in Canada and the United States in 1920, when she had met Clifford Beers, the founder of the American National Committee for Mental Hygiene. In 1923 she and Craig founded the National

Council for Mental Hygiene, now known as the National Council for Mental Health.

In 1939 she became the first woman president of the Royal Medico-Psychological Association. In her presidential address she showed her continuing ability to keep a step ahead of the times, and presciently asked for the wards of mental hospitals to be thrown open not only to the voluntary patients but to any medical men and women who wished to gain experience of this work, urging the value of close relations between "hospitals of all kinds, the medical profession, the social services and the patient's friends." She was also one of the original members of the Churches' Council of Healing, and she continued to serve on the executive committee. Her work was internationally recognised when in 1953 she was elected a member of the committee of honour of the World Federation for Mental Health. The Lady Chichester Hospital remained an enduring interest, and in 1955 as consulting physician she officially opened the new therapy department with the characteristic words "occupation is a grand and healthy thing."

One of her colleagues writes:

Dr. Boyle's outstanding quality was a zest for life. All with whom she came in contact, men, women, and children, were aware of that quality. Her wholehearted interest and generous giving of herself, whether in time, money, or understanding, were always ready when needed. She never forgot the late Sir Walter Fletcher's words to her as a student: "No one should join any profession without being determined to contribute something new of value to that profession." Her work for mental health is a testimony to that ideal.

One of her aims was to interest and inspire her juniors in psychiatry, and this inspiration never failed, as those of us know who worked with her. To the end of her life she never spared herself, nor would she tolerate slackness or poor standards in others, always urging them to use to the full whatever talents they possessed.

It was typical of her that, in order to launch the National Council for Mental Hygiene, she herself paid the first three years' office rent, and she was never defeated by the constant financial anxiety of maintaining and enlarging a voluntary hospital.

Her dauntless courage and Irish humour made her an invaluable friend; this, combined with her determination to fight for what she felt was right, also made her a formidable opponent. She loved life, parties, meeting people, and entertaining her friends, when she would be the centre of interesting talk and gaiety. She believed in the Christian way of life; she believed in work as a remedy for most ills; she believed, in her own words, that for treatment of patients "body, mind, and spirit, each link in the chain, must be tackled." Of these, her beliefs, her life, and work were a living tribute.

HENRY HORACE ANDREWS EMERSON

C.B., D.S.O., M.B. Dubl.

Major-General Emerson, who was director of hygiene at the War Office in the years immediately preceding the late war, died on Nov. 17 at the age of 76.

He was the son of Robert Henry Mulock Emerson and he was educated at Rathmines School, Dublin, where he was captain of the school. He studied medicine at Trinity College, Dublin, winning the Stewart scholarship in physiology and anatomy. He played football and golf, but his chief sport in his student days was rowing, and he was captain of the D.U.B.C. Soon after qualifying in 1905 he joined the R.A.M.C. He served for some years in the East but returned to this country before the 1914–18 war. In 1915 he was posted to the Western front, and he spent the next years in command of a casualty-clearing station in Flanders and France. For his work he was three times mentioned in despatches and was awarded the Croix de Guerre and the D.S.O. Soon after the war he returned to India, and in 1928 he was promoted to the rank of brevet lieut.-colonel; the same year he was appointed deputy director of hygiene and pathology at Army Headquarters at Simla. In 1929 he was promoted to lieut.-colonel, and in 1934 to full colonel. The following year he was appointed director of hygiene at the War Office. He became major-general in 1937, and on his retirement in 1939 he was appointed C.B.

Of Emerson's work as a senior officer H. A. S. writes:

When a major in 1923 Horace Emerson was summoned unexpectedly to act as director of hygiene and pathology at Army Headquarters at Simla, owing to the death of the previous director, and he quickly and confidently settled in to cope with the health problems of the British and Indian troops in India. At the Army School of Hygiene, Aldershot, where he was commandant before taking up the appointment of director of hygiene at the War Office, he was co-inventor of the A.S.H. mobile disinfector with which field-hygiene sections were equipped in 1939. As director of hygiene at the W.O., Emerson was intimately concerned with the establishment and working of the Recruit Physical Development Depots, and he took the greatest pleasure in the success of these units in improving the physique and mental outlook of young, immature, ill-nourished recruits who were thus enabled to pass on to the more strenuous training at their regimental depots. An important decision made by him was to recommend the adoption of the metal-filter type of regimental water-truck, which replaced the cloth-filter type with great success in the late war.

But these glimpses of a hygiene officer's successful career and duties give little insight into his relations with his staff. Emerson got to know his staff and their capabilities well, and, while working them hard, he respected and acknowledged their work. His modest and kindly nature promoted freedom of discussion on technical matters between his juniors and himself, and he was ever helpful where difficulties arose. He was a big man, physically and mentally, and when "ganging his ain gait" covered the ground quickly in long strides giving the impression of ease in action with plenty of reserve to call on. He will long be remembered with loyalty and affection.

Major-General Emerson married Lillie H. Godfrey of Courtrai, Belgium. She died in 1952, and they leave a son and a daughter.

MR. RICHARD WARREN

P. H. M.-B. writes:

Fifty years ago Dicky Warren was one of a grand band of young men who made The London famous. When I first came into contact with him he was surgical registrar. Not only was he the son of a distinguished father, whose name rang in everyone's ears in the days of the Boer war, but he was also a learned disciple of Oxford, with scholarships and prizes to his credit. He was cheery, handsome, tall, with a fine presence and athletic figure. What more could anyone want! Affable and approachable by all, he was naturally popular with the students and in a company which included Jimmy Sherren, Henry Souttar, Frank Kidd, James Walton, Hubert Turnbull and many others.

He had a reputation as a boxer and he was respected by students on that account. In the ring he was as agile as a monkey, dancing around like a ballet dancer, whilst raining the lightest of blows on the nose, ears or solar plexus as he listed; but in addition he was an artful dodger. He was never so happy as when he donned the gloves and it was his habit to have a round with me every day for the good of his soul.

He was a good surgeon with dexterous technique and a clear mind. I have been always glad to know that he found his metier at Weston-super-Mare, but at the same time the London Hospital lost a loyal and devoted son.

Appointments

JANCAR, JOZE, M.B. N.U.I., D.P.M.: assistant psychiatrist, Stoke Park Hospital group, Bristol.

MACCULLOCH, G. T., M.B. Glasg.: assistant M.O., Bradford.

MORRIS, A. H., M.B. Sheff., D.M.R.D.: consultant radiologist, Nottingham General Hospital.

OUNSTED, CHRISTOPHER, D.M. Oxon., D.C.H., D.P.M.: consultant in child psychiatry, Warneford and Park Hospitals, Oxford.

TOMLINSON, PETER, M.D. Lond., D.T.M. & H., D.P.H.: assistant M.O., Bristol.

WARBOYS, J. W., M.D. Sheff., D.P.M.: consultant psychiatrist, Tone Vale Hospital, near Taunton.

The Hospital for Sick Children, Great Ormond Street, London:

BROOMHEAD, I. W., M.B. Cantab., F.R.C.S.: part-time senior registrar in plastic surgery (to be shared with St. Thomas' Hospital).

GRANTZ, CHARLOTTE, M.D. Harvard: house-physician.

YENTIS, IRVAN, M.D. Lond., M.R.C.P., F.F.R., D.M.R.D.: senior registrar in radiology (to be shared with University College Hospital).

Lancashire County Council:

COOPER, N., M.B., D.P.H.: assistant divisional M.O.

HAIGH, KATHLEEN M. C., M.B. Leeds, D.Obst., D.P.H.: assistant divisional M.O.

HARRIS, CHARLES, M.B. Dubl.: assistant divisional M.O.

HOLT, P. G., M.B. Lpool, D.P.H.: assistant divisional M.O.

KELLY, A. D., L.R.C.P.I., D.P.H.: assistant divisional M.O.

SHERRATT, T. W., M.R.C.S., L.D.S.: assistant divisional M.O.

TILLEY, J. H. M., M.B. Cantab., D.P.H.: assistant divisional M.O.

TIMPANY, MARGARET M., M.B. Edin., D.P.M.: assistant divisional M.O.

Notes and News

COLOUR TELEVISION IN TEACHING

MANY people have strong views about the merits of television, and when colour television arrives in force the debate is unlikely to become any less robust. So far, however, few people have seen it, and to know what quality of reproduction it can consistently achieve we must often depend on the experience of those closely concerned in its development. A demonstration held in London last week aimed at bringing colour television to the closer attention of medical teachers by showing them what it could do and at the same time exploring some possible applications in medical teaching. Those in the audience who were seeing television in colour for the first time must have been impressed by the technical results achieved by a closed-circuit system. From cameras at Alexandra Palace demonstrations by members of the teaching staff of Guy's Hospital were relayed by land line to a projection receiver in a hall near Broadcasting House, where other Guy's teachers commented on what the screen showed and talked to the demonstrators from time to time. Though the colour reproduction was not invariably satisfactory and occasional lighting troubles cropped up, the general standard of the picture was very high. One clinical demonstration illustrated some physical signs in a man with aortic incompetence, and capillary pulsation could be seen in the skin of his forehead. The other clinical subjects in a programme of 16 brief demonstrations included psoriasis, intravenous injection, manipulation of the neck, Addison's disease, and the effect of drugs on the pupil. A forensic drama, *What to Do with a Dead Body*, illustrated another way of using this spectacular apparatus.

The colour-television camera analyses the scene before it into red, green, and blue components, and in the closed circuit in last week's demonstration the three signals were encoded into one composite signal which could be transmitted through a single cable. The use of a single cable involves a loss of quality, and a more efficient system is one which includes a separate cable for each colour. Such a system could be installed over the shorter distance required to equip, say, a medical school with closed-circuit colour television. The colour cameras at present available are in many ways unsuited to the kind of work they were asked to do in this demonstration, and better results can also be expected as new cameras come into use.

The ability of this form of colour television to do at least as much in the way of faithful reproduction as the colour film is proved. What medical teachers now want to know is how much it can help them and their students, and whether the benefits justify the cost. For instance, what advantages has colour television over a colour film, which, once made, can be presented much more simply? Points that have been made in television's favour are its flexibility and spontaneity, and the way an audience can be drawn more closely into a demonstration than is possible with a film. We have expressed doubts [1] about the value of television in medical schools; but we are much impressed by the achievements of the energetic Guy's team and by the results which were made possible in this demonstration by the skill of the engineers of the British Broadcasting Corporation and the Marconi's Wireless Telegraph Company. This was the longest colour transmission yet made from Alexandra Palace, and the B.B.C. devoted much time and effort to ensuring its success. On this evidence, further inquiries and experiments with colour television as a teaching tool seem amply justified; and one way of exploring the possibilities would be to install a closed-circuit system in a medical school, so that the method can be thoroughly examined.

HYPOGAMMAGLOBULINÆMIA

ARRANGEMENTS have been made by the Ministry of Health, in consultation with the Medical Research Council, to set aside limited supplies of γ-globulin for the treatment of suitable cases of hypogammaglobulinæmia. A working party of the Medical Research Council has been set up to advise on the allocation of this material and to organise a coordinated clinical trial to assess its efficacy. Doctors with patients in whom hypogammaglobulinæmia has been diagnosed are invited to get into touch with Dr. P. O. Williams, secretary of the working party on hypogammaglobulinæmia, 38, Old Queen Street, Westminster, S.W.1.

1. *Lancet*, 1957, i. 1078.

ATOMIC ENERGY AND MENTAL HEALTH

The irrational fears and hopes provoked by developments in the use of atomic power have been examined by a study group of the World Health Organisation, meeting in Geneva with Prof. Hans Hoff, of Vienna, as chairman. Its other medical members included Dr. Brock Chisholm, Dr. J. S. Riach, and (as consultant) Dr. Kenneth Soddy.

Noting a widespread sense of disorientation in regard to atomic energy, and a mistrust of most information sources, the group attribute these partly to wars, psychological warfare, political propaganda, and even competitive commercial advertising, but go on to point out that science has lost the infallibility with which it was credited in the 19th century. The publicising of disagreements among scientists—for example about poliomyelitis vaccine, or the cancer-producing effects of tobacco—has contributed to a distrust of scientific pronouncements which is often reflected in deliberately anti-scientific attitudes. Other factors which have helped to create a disturbing background for the emergence of atomic energy include science fiction, with its emphasis on the horror of scientific power, the "death ray," and the "mad scientist."

Irrational fears are expressed far more often than irrational hopes, but the group see the latter as potentially a greater danger to mental health. Many people expect immediate returns from atomic energy in terms of prestige and amenities, for the first time putting poor countries on a par with the richest. The disparity between aspirations and results could lead to hostile attitudes.

In many countries and at many levels of society—and even among scientists—there is a feeling that there are no mental-health aspects of atomic energy. The group regard this as in part a sign of the general distaste for facing psychiatric problems; but the avoidance and rejection of the subject is probably in itself a sign of anxiety. Denial of the problem could lead to over-confidence and to further difficulties, and research into this matter is of urgent importance.

The group conclude that the complexity of underlying emotions in the changing environment of the Second Industrial Revolution need to be recognised more widely among leaders of thought and action. The first task seems to be to establish what may be termed a culture of change, in which change and reorientation can take place without upheaval. The chief effort will have to be directed towards securing for adults a greater intellectual grasp and thus a better understanding of the new situation. The group feel, however, that the main duty of the present generation is toward its children. Their upbringing must enable them to put up with insecurity and to face reality. This upbringing must be free from anxiety and hate, producing in individuals self-reliance and a sense of responsibility towards others.

As regards local action, a plan was discussed for the education of the community about atomic energy. In essence, the idea is to form small teams, consisting, for example, of a psychiatrist, a psychologist, a sociologist and a journalist. Such a team would study local conditions and contribute to the planning of new atomic eneterprises and also to their acceptance by the pople.

In conclusion, the group express a hope that persons in authority will agree that the behavioural sciences can make a valuable contribution to the adaptation of mankind to the advent of atomic power.

CARDS IN GOOD CAUSES

LAST year we ventured a word of approval for home-made Christmas cards; this year, after experience in making some, we can heartily recommend readers to buy theirs. The first thought is exciting: there will be the satisfying glow of creative activity. Then, a card made by oneself is so much more personal; and even if it has not the professional polish, one's friends will appreciate the hand-made look. And the money saved! After very many hours of labour, and ruinous expenditure on paper, paint, brushes, ink, and nibs, a few cards emerge—of such a shape that no envelope can be found to fit them. Many have been spoiled and rejected. The husband, who did the lettering, wants to throw away half the surviving cards because the picture is so ill done, and the wife, who did the pictures, wants to throw away the other half because she is ashamed of the poor lettering; the marriage totters. The cards certainly look hand-made (if not foot-made); but one must be bold as brass to send them to people one loves—especially when one can send really pleasing cards *and* get a glow of satisfaction by choosing those published in good causes.

Among the most original this year are those of the United Nations (UNICEF), 14, Stratford Place, London, W.1. They are sold in boxes of 10 at 7*s.* 6*d.* One box has 5 designs by Ludwig Bemelmans showing music-making, including sleigh-bells, and another has an abstract design by Hans Erni, symbolising the community of man: thus all tastes are catered for. Other boxes contain charming cards with pictures from Vietnam of children learning to write and to sew. The National Association for Mental Health, 39, Queen Anne Street, London, W.1, is again issuing many of its well-tried and tasteful cards; all are black and white, most are reproductions of paintings by old masters or statuettes. New this year are a contemporary Chinese drawing, by Luca C'en, of the flight into Egypt; and a nativity from the school of Masaccio. All these cost 6*s.* 9*d.* a dozen. The many who find maps irresistible will enjoy a new card published by the Grenfell Association, 66, Victoria Street, London, W.1, showing the Labrador coast and Newfoundland where the Association does its work. The Grenfell Association's other cards all have snow settings; their prices range from 6*d.* to 1*s.* 2*d.* each. For the Oxford Committee for Famine Relief (P.O. Box 11, 17, Broad Street, Oxford) Leslie Durham has designed three simple cards, differing in mood. A sample set may be had for 1*s.* 9*d.* post free.

For those who have already bought (or made) their cards, the National Association for the Prevention of Tuberculosis, Tavistock House North, London, W.C.1, is issuing 200,000,000 seals with Christmas subjects, price 4*s.* a hundred. The National Spastics Society, 28, Fitzroy Square, London, W.1, has produced rather bigger seals at 1*d.* each; anyone who buys 60 seals is entitled to enter for a competition with several hundred prizes including a centrally heated house and a yacht.

BICYCLE ACCIDENTS

MOTORISTS have a steel carapace, and pedestrians move slowly; but cyclists are exposed and move quickly—especially those who favour motor-assisted cycles. In 1955, 3307 of these machine-propelled cyclists were injured and 60 killed. The Road Research Laboratory has been studying accidents to cyclists relying on such engines or on pedals, and they have now issued recommendations.[1]

Most fatalities were due to head injuries, and crash helmets are advised. A third of the accidents to motor-assisted cyclists and a fifth of those to pedal cyclists involved no other vehicle, but injuries caused by motorists carelessly opening doors were common. The brakes of these cycles were often inadequate for their performance, and the headlamps inefficient. Rear-view mirrors are recommended. Since a disproportionate number of old people were among the injured, it is suggested that the layout of the controls should be improved, and the effort needed to stop and start the machine should be reduced.

A VIGOROUS CRITIC

"ANY man," said Aristotle, "can be angry, for that demands no skill. But to be angry with the right person, in the right degree and at the right time, for a right reason and in a right way, lies in the power of few, and is very difficult."

Dr. Louis Goldman, a young South African, who studied for a postgraduate qualification in this country and who worked in several British hospitals, has recorded[2] his anger against the conditions under which the junior medical staff of those hospitals were employed. He was particularly provoked by their low salaries and the uncertainty of their prospects in any specialist career. His book was written as a protest against imperfections in the National Health Service by one who had no fear of reprisal or victimisation since he did not seek an appointment within it.

The protest is addressed to the general public (indeed much of it has already appeared in the *Observer*), and its readers will often have only vague and inaccurate ideas of how a hospital functions, of the order of the ranks in the medical hierarchy, and of the significance of the various qualifying and postgraduate diplomas. Every doctor who has tried to explain these things will know how hard it is, and some of Dr. Goldman's best chapters are those introducing this essential background. Thereafter, he discusses the salary and the duty hours for which the houseman works, the long struggle which is the lot of the registrar, and the "bottleneck" which he must negotiate to achieve consultant status. The teaching hospitals come in for strong attack as influences which further constrict this strait passage for those who have not served in them.

Dr. Goldman strives to show that if general practitioners were more closely incorporated in hospital organisation there would ensue a threefold improvement—in the working conditions of the junior staff, in the prospects of those registrars who never become full consultants, and in the service available to the patients themselves at home or in institutions.

Dr. Goldman inveighs lucidly, emphatically, and convincingly against undoubted weaknesses in the fabric of a scheme which is still young, and which few will deny needs modifications. It is easy to sympathise with him and to understand his anger. But whether it has been—as measured by the philosopher's criteria—judiciously expressed is something which every doctor will have to decide for himself.

1. Department of Scientific and Industrial Research. Road Research Technical Paper no. 38. H.M. Stationery Office, 2*s.* 9*d.*
2. Angry Young Doctor. By LOUIS GOLDMAN, M.B. London: Hamish Hamilton. 1957. Pp. 114. 5*s.*

University of Cambridge

On Nov. 16 the degree of M.B. was conferred on J. H. Gervis (by proxy).

University of London

On Nov. 22 the honorary degree of LL.D. was conferred on Sir Charles Lovatt Evans.

The degree of PH.D. in the faculty of medicine has been conferred on Pamela C. B. MacKinnon and D. S. McLaren.

University of Edinburgh

Mr. G. P. Mitchell has been appointed as part-time lecturer in the department of orthopædic surgery, and Dr. J. W. Black as assistant in the department of pathology.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on Nov. 23, with Prof. A. M. Claye, the president, in the chair, the William Blair-Bell lecture for 1958 was awarded to J. M. Crawford and J. S. Scott, and the Green-Armytage Anglo-American sterility lecture for 1958 to V. B. Green-Armytage.

The diploma in obstetrics was awarded to the following:

Syed Manzaruddin Ahsan, S. W. Albright, Elaine M. Allen, Sheila Allison, Prasannatissa Harischandra Amarasinghe, J. A. R. Anson, Hamida Khatoon Aravi, Alison M. Armstrong, Michael Ashley-Miller, Pramil Gopal Asolkar, M. J. Atwill, J. G. Banwell, A. R. Barber, C. J. Barlow, Betty Bass, A. T. Battle, W. G. Batty, J. D. C. Baxandall, Jean M. Bebell, Esther A. Bence, R. J. J. Bennett, R. J. Bennison, Paresh Chandra Bhattacharjya, R. F. Blackburn, P. W. S. Blake, Sidney Blumenthal, V. A. W. Blunt, May Blythe, D. G. Boddington, C. J. Booth, R. W. Bowen, J. A. Bowles, Muriel A. Boyd, A. J. Bray, M. G. Bridger, Susan M. Brocklesby, Daphne J. Broughton, Sheila M. McN. Brownlie, R. A. Burke, P. J. Burrows, W. C. Canning, Sarah Capell, G. B. Carter, R. H. Castle, R. B. Chalmers, D. Pui Chee Chan, J. D. Chard, June M. Cheetham, Kyi Kyi Chit, J. C. T. Church, D. B. Clark, A. D. Clift, E. C. Cockings, Lester Cohen, T. L. Cooksey, D. E. Corlett, R. G. Counihan, Alan Coxon, H. L. Craig, Shirley A. Craven, I. B. Crawford, J. W. Crawford, Jean E. Cree, A. D. Crew, Jill T. Crossley, M. J. Curry, A. E. Cutler, B. R. F. Daniel, Henry Paterson Davie, J. A. H. Davies, J. G. Davies, J. M. P. Davies, Bryan Dawson, D. T. F. Deakin, L. S. Deane, A. R. Dewsbury, H. P. Dinwoodie, L. J. Dolan, C. J. Drouet, I. C. Dow, Sheila L. B. Duncan, Mary Ellis, D. J. Fairclough, H. P. L. Falla, T. P. Fidgeon, C. D. Fisher, M. L. Fisher, G. S. Flack, C. B. Floyd, D. E. Ford, E. R. Ford, A. J. Fry, Pamela M. Fullerton, Elizabeth George, S. W. George, A. J. Gibson, Iris I. J. M. Gibson, P. M. S. Gillam, Indira Gupta, Catherine E. Hall, B. F. Hallatt, Sheila P. Hancock, T. M. Hardiker, R. G. Hardy, C. S. Harison, John Harkness, M. B. Harris, J. F. Harrison, P. A. Harrison, G. W. Hatcher, M. J. Healy, G. W. Holmes, J. C. Hay, G. T. Haysey, R. I. Henry, G. G. Hill, M. J. Hodgson, H. M. Holden, David Hooker, P. D. Hooper, Ann Horsburgh, Evelyn C. Hover, Rosemary Hulley, John Hunnybun, William Inglis, E. C. Jelly, Sarah D. Killough, D. D. Kinn, J. P. Knowles, G. B. Knox, J. R. Lamb, D. M. Lasman, Margaret R. A. Lawrence, W. J. Leishman, W. M. Lennox, D. G. Lethem, J. G. Lindsay, Yuin B. Ling, A. S. Little, J. F. Lloyd-Thomas, H. I. Lockett, David Longbourne, F. J. Lowe, R. R. Macdonald, H. A. McClelland, Bertha S. McGill, Joyce A. McLeod, D. M. Mann, Stella M. Manners, I. G. Marsh, Walter Marshall, R. J. Mather, John Meecham, J. K. Millar, Alicon V. Milles, W. F. Millner, Cathie D. Moffatt, Alan Moore, M. T. Morgan, Shirley P. K. Morris, Barrie Murphy, Aileen P. Musgrave, G. R. Myall, M. J. Mynott, J. F. M. Newman, Jean S. M. Ogden, C. S. Pallewela, B. K. Palmer, George Park, Elizabeth A. M. Parkes, H. W. Parry-Williams, Joyce M. Pearce, Mavis M. Polkinghorne, Walter Pollard, J. B. Pond, Ann Priestman, C. W. Pook, Samuel Priestman, Avril E. Reed, I. D. G. Richards, A. G. Rickenbach, Joan M. Ridley, R. P. Rosswick, Doreen Rothman, Ashleigh Roundhill, P. F. W. Rowell, R. C. I. Russell, J. F. Ryan, J. D. Salmon, E. M. Salt, D. W. I. M. Sandilands, Padma Raju Sathyanadhan, Henry Savage, Patricia M. Scott, R. J. Scott, V. F. Shah, Savitre Shahani, R. K. Shelat, T. G. Skinner, R. M. Slater, C. C. S. Slorach, P. J. G. Smart, Alexandra G. Smith, D. L. Smith, R. G. Smith, Gillian M. W. Smith, W. T. Somerville, Michael Speight, W. McA. Speirs, Peter Stallabrass, T. A. M. Staunton, G. R. Stevenson, J. S. K. Stevenson, J. L. Stevenson, J. B. Stillwell, Ian Stuart, J. F. Sturridge, K. M. Tankard, J. G. Teall, G. G. Temple, D. K. M. Thomas, T. E. Torbet, H. H. Thomson, Lucy A. Wagstaff, P. D. B. Wallice, Betty R. Warltier, Jean L. Ward, Jean M. Watkins, Betty P. Westworth, George White, R. M. Whittington, David Wild, J. G. P. Williams, D. B. Williamson, Myint Myint Win, Edwin Man-Wei Wong, D. F. P. Wooding, J. E. Woodyard, Douglas Wright, D. A. Youdale.

University of Birmingham

Dr. A. P. D. Thomson, senior lecturer in anatomy, has been appointed to the newly established office of senior tutor and assistant dean, and Dr. J. M. Malins, university clinical lecturer in medicine, to the newly established office of admissions tutor. The following other appointments are also announced: Dr. J. S. Howell as M. C. Smith lecturer in pathology (cancer research), Dr. J. R. P. Gibbons as research fellow in anatomy, and Mr. P. Jameson Evans as part-time lecturer in ophthalmology.

University of Western Australia

Dr. W. B. Macdonald, lecturer in pædiatrics in the University of London at St. Mary's Hospital Medical School, has been appointed to the chair of child health.

Clean Air Council for Scotland

Dr. I. A. G. MacQueen, medical officer of health for Aberdeen, has been appointed a member of this council.

Heberden Society

The annual general meeting of this society will be held on Friday and Saturday, Dec. 13 and 14, at the Wellcome Foundation, Euston Road, London, N.W.1. At 5 P.M. on the 13th Prof. K. Brøchner-Mortensen will deliver the 1957 Heberden oration. He is to speak on gout.

Factory Inspectorate

Mr. T. W. McCullough has been appointed Chief Inspector of Factories in succession to Sir George Barnett, who retires on Dec. 31. Mr. McCullough, who is 56, has been a deputy chief inspector since 1953.

British Congress of Obstetrics and Gynæcology

This congress will be held in Cardiff on July 14, 15, and 16, 1959. The programme will include a symposium on the influence of certain factors in pregnancy and labour on the future development of the child. Other subjects proposed for discussion are psychosomatic gynæcology, ovarian malignant disease, œstrogen metabolism, and oxytocic drugs. The honorary secretaries of the congress may be addressed at the Maternity Hospital, Glossop Terrace, Cardiff, Wales.

Association of Anæsthetists

The silver jubilee meeting of this association will be held from Dec. 4 to 7, at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2. Details may be had from the secretary of the association, 47, Lincoln's Inn Fields, W.C.2.

Royal National Throat, Nose and Ear Hospital and Institute of Laryngology and Otology

The joint annual dinner of the hospital and institute was held in London at the Royal College of Surgeons on Nov. 22. Proposing The Hospital and Institute, "this lively institution," Lieut-General Sir Alexander Drummond, Director-General of the Army Medical Services and a former registrar of the hospital, declared that every postgraduate who had worked there maintained a keen interest in the welfare of the two establishments. In recent years their traditions had been enhanced; and Sir Alexander referred particularly to the fruitful efforts of Mr. Ernest Taylor, the hospital's chairman. To his hard work today's sound situation was largely due. Mr. John Young, the house governor, "a kindly administrator," had also contributed greatly by his devotion and able leadership. And Sir Alexander spoke appreciatively of the part played by Prof. F. C. Ormerod and Mr. C. Gill-Carey in the advancement of hospital and institute. In his reply Mr. Taylor could speak of steady progress, and he told of some of the ways in which the material resources of the hospital and institute had lately been fortified. The Guests received a friendly and amusing welcome from the chairman Dr. Stephen Coffin, senior member of the hospital staff; and Miss Josephine Collier replied. The chairman's health was cordially proposed by Mr. J. C. Hogg.

Mr. Terence Cawthorne is to be the guest lecturer of the Research Study Club of Los Angeles at their mid-winter convention on Jan. 20.

CORRIGENDUM: *Hæmochromatosis and Transfusional Siderosis.*—In this leading article last week (p. 1044) we mis-spelt the name of Prof. D. F. Cappell, whose recent joint report (*J. Path. Bact.* 1957, **74**, 245) we were discussing.

Diary of the Week

DEC. 1 TO 7

Monday, 2nd

UNIVERSITY COLLEGE, Gower Street, W.C.1
5 P.M. Dr. Harry Harris: Human Biochemical Genetics (second of three lectures).

POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
4 P.M. Dr. R. I. S. Bayliss: Pathogenesis and Treatment of Œdema; the Clinical Use of Diuretics.

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.1
5 P.M. Academician E. A. Astratyan (Moscow): The Compensatory Function of the Brain.

Tuesday, 3rd

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8.30 P.M. *Orthopædics.* Mr. J. I. P. James, Mr. Henry Osmond-Clarke, Mr. Robert Roaf: Treatment of Organic Spinal Deformities.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. K. W. Cross: Anoxia of the Newborn.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, W.2
5 P.M. Dr. Manuel Lederman: Radiotherapy of Carcinoma of the Cervix.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. R. H. Meara: Atopy.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, Dean Street, W.1
5.30 P.M. Dr. F. D. Bosanquet: Neuropathology.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Dr. N. C. Oswald: Pulmonary Changes in Some Systemic Diseases.

Wednesday, 4th

ROYAL SOCIETY OF MEDICINE
5.15 P.M. *History of Medicine.* Dr. A. M. Cooke: Daniel Whistler—a Revaluation.
8 P.M. *Surgery.* Dr. Leandro M. Tocantins (Philadelphia) and American panel, Mr. A. Dickson Wright and British panel: Advances in Chemotherapy of Cancer. (Transatlantic discussion.)

POSTGRADUATE MEDICAL SCHOOL
2 P.M. Prof. G. H. Lathe: Bilirubin.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. J. O. Oliver: Bacterial Flora of Normal Skin.

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. Kenneth Robson: Observations on the Diagnosis and Treatment of Empyema Thoracis.

INSTITUTE OF NEUROLOGY
5.30 P.M. Mr. Kenneth Till: Trauma.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. Marjorie M. Wilson: Cerebral Palsy—Facing the Facts.

MIDLAND MEDICAL SOCIETY
8.15 P.M. (36, Harborne Road, Edgbaston, Birmingham, 15.) Mr. J. Leigh Collis: Reflux Œsophagitis.

MANCHESTER MEDICAL SOCIETY, University of Manchester
4.30 P.M. *Medicine.* Dr. William Robinson: New Therapeutic Methods for Chronic Brochitis.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. (18, Nicolson Street.) Dr. A. A. Donaldson, Dr. D. R. Maitland, Dr. Thomas Philip: Angiography.

Thursday, 5th

ROYAL SOCIETY OF MEDICINE
5 P.M. *United Services.* Lieut.-Commander J. H. Ebersole, U.S.N.: Medical Experiences in U.S. Submarines *Nautilus* and *Seawolf.*
8 P.M. *Neurology.* Dr. A. M. G. Campbell: Ætiology of Polyneuritis. Dr. C. W. M. Whitty: Referred Pain. Dr. J. M. Jefferson: Metachromatic Leuco-dystrophy.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Dr. R. J. W. Rees: Experimental Approach to the Problems of Resistance to Tuberculosis.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
4.30 P.M. (Chelsea Hospital for Women, Dovehouse Street, S.W.3.) Dr. G. I. M. Swyer: Intersex.

LIVERPOOL MEDICAL INSTITUTE, 114, Mount Pleasant, Liverpool, 3
8 P.M. Dr. C. A. St. Hill: Forensic Medicine.

HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Teviot Place, Edinburgh.) Dr. M. F. Oliver: Metabolic, Endocrine, and Therapeutic Aspects of Coronary Atherosclerosis.

UNIVERSITY OF ST. ANDREWS
5 P.M. (Physiology Department, Queen's College.) Prof. G. I. Scott: Papillœdema, Optic Neuritis, and Optic Atrophy.

Friday, 6th

ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Otology.* Dr. Ivor Rosen. Mr. Terence Cawthorne, Mr. Robert Venters: Stapes Mobilisation.
2.30 P.M. *Laryngology.* Prof. E. W. Walls, Mr. F. Boyes Korkis, Mr. M. Spencer Harrison: Pharyngeal Diverticula.
5 P.M. (Royal College of Surgeons, Lincoln's Inn Fields, W.C.2.) *Anæsthetics.* Dr. H. K. Beecher (Boston): Control of Mental States with Drugs.

POSTGRADUATE MEDICAL SCHOOL
10 A.M. Miss Doreen Nightingale: Treatment of Bronchiectasis.
4 P.M. Sir Geoffrey Jefferson: A Surgical Neurologist Looks at the Brain.

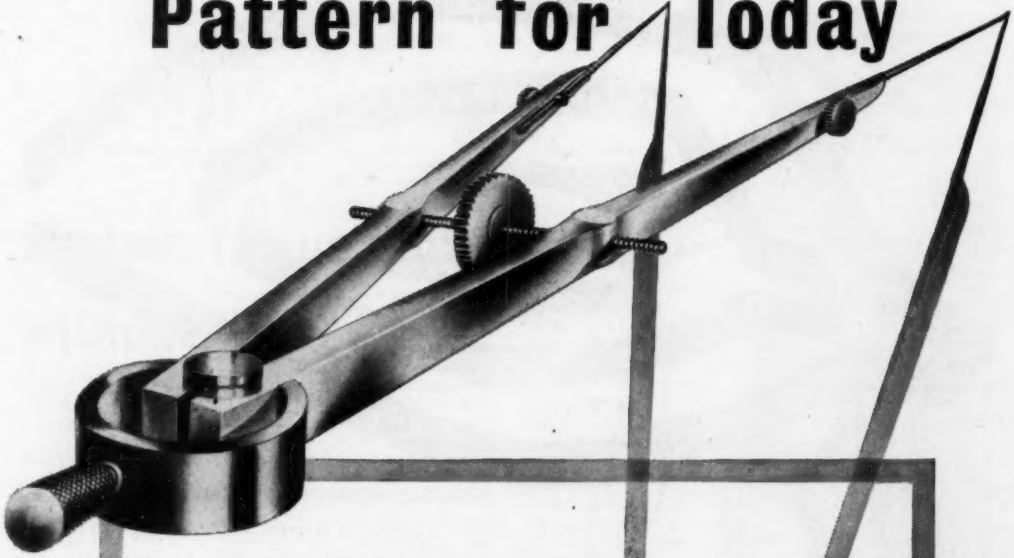
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
2 P.M. (Hammersmith Hospital, Ducane Road, W.12.) Mr. W. R. Winterton: Carcinoma of the Uterus.

OXFORD UNIVERSITY
9.15 A.M. (Radcliffe Infirmary) Prof. Thomas McKeown: Inheritance and Environment in Relation to Disease.

Saturday, 7th

MIDLAND THORACIC SOCIETY
3 P.M. (Birmingham Chest Clinic) Dr. A. Clark Penman: Small Scale Trials. (Presidential address.)

Pattern for Today



Today, the preference is for oral rather than parenteral treatment—provided it is as effective. Penicillin-V has precisely this advantage, giving clinical results consistently comparable with injectable penicillin. It achieves this end because, unlike penicillin-G, it is remarkably stable in gastric secretion. Penicillin-V gives higher blood levels than other oral penicillins and is more potent, dose for dose. When penicillin is indicated, let Penicillin-V-Lilly be the choice.

Average Dose:	125mg. (200,000 units) four times daily, increased in severe infections.
'Pulvules'	125mg. and 250mg.
Suspension	Paediatric 62.5mg. per 5cc.
	Also as Tablets and Suspension Penicillin-V-Sulpha Lilly.

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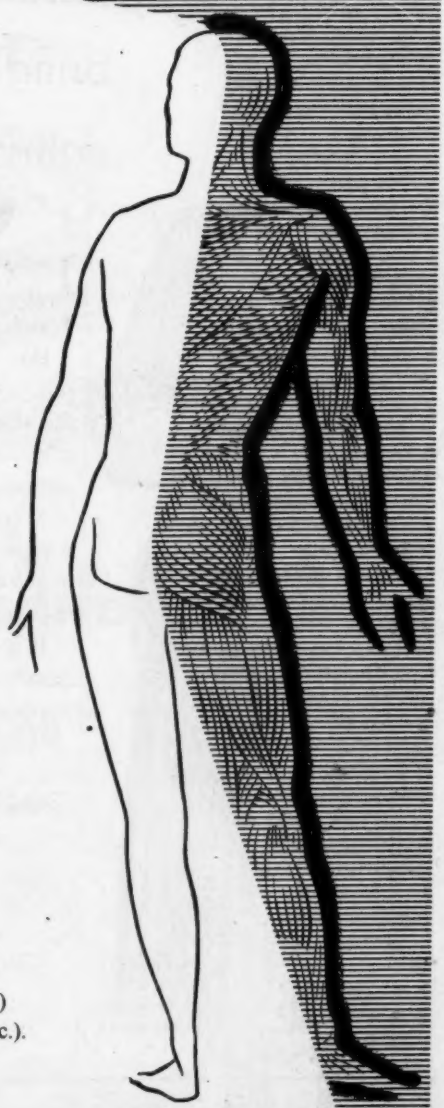

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For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

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Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

CHARLES FREDERICK TERENCE EAST, D.M., F.R.C.P., will deliver the FITZPATRICK LECTURES on TUESDAY, 10TH and THURSDAY, 12TH DECEMBER, 1957, at 5 P.M. at the College.

Subject: "Some Aspects of the History of Cardiology:
1. Lessons of the Deadhouse.
2. Heart Failure and Treatment."

Any member of the Medical Profession admitted on presentation of card.

By order of the President,
HAROLD BOLDERO, Registrar.

ST. BARTHOLOMEW'S HOSPITAL MEDICAL COLLEGE

FINAL F.R.C.S.—MAY, 1958

A COURSE will be held for the above examination on TUESDAY and THURSDAY evenings at 6.30 P.M., starting on TUESDAY, 25TH FEBRUARY, 1958, and ending on THURSDAY, 24TH APRIL, 1958.

The course will consist of 16 clinical tutorial classes with short cases, followed by lecture-demonstrations on selected subjects. The course is not comprehensive. The class will be limited to 24 members.

Fee: 20 guineas, or to Bart's men 15 guineas.

Applications to the Sub-Dean, St. Bartholomew's Hospital Medical College, West Smithfield, E.C.1.

THE HEBERDEN SOCIETY

ON FRIDAY, 13TH DECEMBER, 1957, at 5 P.M., Dr. K. BRØCHNER-MORTENSEN will deliver the Heberden Oration for 1957 at The Wellcome Foundation, Euston-road, London, entitled "Gout."

Members of the medical profession are cordially invited to attend.

NAPT

SYMPOSIUM ON CARDIAC PROBLEMS FOR GENERAL PHYSICIANS. Chairman: K. SHIRLEY SMITH, B.SC., M.D., F.R.C.P., FRIDAY, 6TH DECEMBER, 3.30–6.30, Great Hall, B.M.A. House, W.C.1.

Tickets, including afternoon tea and sherry, 10s.

Details from NAPT, Tavistock House North, W.C.1.

BEIT MEMORIAL FELLOWSHIPS FOR MEDICAL RESEARCH

Notice is hereby given that an ELECTION of Junior Fellows to begin work on 1ST OCTOBER next will take place in May, 1958. Junior Fellowships have successive annual values of £900, £950 and £1000 for 3 years. As a rule, superannuation benefits are provided, to which the successful candidates will be required to contribute 5% of the annual stipend and to which the Trust will make a contribution of 10%. Candidates must have taken a degree in a faculty of a university approved by the Trustees in Her Majesty's Dominions, Protectorates and Mandated Territories, India, Pakistan and the Republic of Ireland, or a medical diploma registrable in the United Kingdom. Elections to Junior Fellowships are rarely made above the age of 35 years.

Applications from candidates must be received not later than 1st April. Candidates must submit evidence that they can be given accommodation in the departments where they propose to work, which must be either in Great Britain or Ireland. Forms of application and all information may be obtained by letter only, addressed to the Secretary, Beit Memorial Fellowships for Medical Research, The Lister Institute, Chelsea Bridge-road, London, S.W.1. For Overseas candidates forms of application may be obtained from the Secretary, South African Medical Council, P.O. Box 205, Pretoria, South Africa; the Director, Commonwealth Office of Education, Box 3879, Sydney, Australia; the Department of Health, Wellington, New Zealand; and the Canadian Medical Association, 244, St. George-street, Toronto, Canada.

THE MIDDLESEX HOSPITAL MEDICAL SCHOOL

LEVERHULME RESEARCH SCHOLARSHIP IN CLINICAL MEDICINE

Applications are invited for a Leverhulme Research Scholarship, value £1000 p.a., plus superannuation. The Scholarship shall be for 1 year in the first instance. The scholar must satisfy the Middlesex Hospital Medical School that the major part of his time will be spent in research, but he may be allowed to hold other appointments. The work may be related to any branch of medicine, must be essentially clinical, and will be carried out in the Institute of Clinical Research attached to the Middlesex Hospital Medical School.

Applications, with the names of 2 referees and a summary of the proposed work, should reach the Secretary of the Institute of Clinical Research, The Middlesex Hospital Medical School, 40, Hanson-street, London, W.1, not later than 4th January, 1958.

BRITISH ASSOCIATION OF PHYSICAL MEDICINE

A WEEK-END COURSE designed primarily for those taking the Diploma in Physical Medicine will be held on 24TH, 25TH and 26TH JANUARY, 1958.

Further details can be obtained from the Honorary Secretary of the Association, 47, Lincoln's Inn-fields, London, W.C.2.

MEDICAL REGISTRATION COUNCIL

ELECTION

Notice is hereby given pursuant to the Medical Practitioners' Act, 1927, and the rules thereunder, that there will be an Election of 2 Direct Representatives to be members of the Medical Registration Council.

Voting papers will be sent early in December to each medical practitioner registered in the Medical Register of Ireland, with a registered address in the Republic.

Votes cast by voting papers received by the Returning Officer after the 29th day of December, 1957, will be invalid.

Further particulars may be obtained at the office of the Medical Registration Council, 68, Fitzwilliam-square, Dublin.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL

BORLAND (MEDICAL) ENTRANCE SCHOLARSHIP FOR WOMEN—VALUE £500

Applications are invited from the daughters of Men and Women of the Medical or Dental Register, or of Barristers or C.E. Clergy or of men who have, at any time, held an office in any of the fighting forces, for a scholarship tenable from October, 1958.

Further particulars and application form from the Secretary, King's College Hospital Medical School, Denmark-hill, London, S.E.5. Closing date 16th December, 1957.

ANÆSTHETICS COURSE

A 2 weeks' COURSE OF LECTURES, DEMONSTRATIONS AND TUTORIALS for postgraduates preparing for higher diplomas in Anæsthetics will be held from 10TH to 21ST FEBRUARY, 1958.

Fees:

Lectures and Demonstrations, £15 15s.

Tutorial Discussion Groups, £10 10s.

Further details and application forms may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetists, Royal College of Surgeons, Lincoln's Inn-fields, London, W.C.2 (Tel. HOLborn 3474, ext. 23).

INSTITUTE OF UROLOGY. In association with ST. PETER'S, ST. PAUL'S AND ST. PHILIP'S HOSPITALS. Applications are invited for an appointment as RADIOLOGICAL RESEARCH ASSISTANT for 3 notional half-days per week, mainly in the X-ray Departments of St. Peter's and St. Paul's Hospitals. Salary at the rate of £680 p.a. The appointment will be for 1 year in the first instance. Candidates should be prepared to undertake research in the cine-radiography with the image intensifier and should have experience in radiology.

Applications, with the names of 3 referees, should be forwarded to the Secretary, Institute of Urology, 10, Henrietta-street, London, W.C.2, by 20th December, 1957. Further information may be obtained on request.

EDINBURGH. NORTHERN GENERAL HOSPITAL. Applications are invited for a CLINICAL RESEARCH FELLOWSHIP. The successful candidate will be attached to the Unit for Chronic Rheumatic Diseases, Northern General Hospital. The appointment will be for 1 year in the first place. Salary £850–£1200, depending on qualifications and experience. The Fellow would take full part in the clinical activities of the Unit, and ample laboratory facilities are available for research. The scheme is supported by the Nuffield Foundation.

Applications, with names of 2 referees, to be sent to the Secretary, Edinburgh Northern Hospitals Board of Management, Ferry-road, Edinburgh, 5, as soon as possible.

THE UNIVERSITY OF MANCHESTER. Applications are invited for a post of RESEARCH ASSISTANT in the Department of Bacteriology. The successful candidate will be required to assist in a programme of work on immunochemistry. The appointment will be made for 1 year in the first instance, and preference will be given to candidates with a postgraduate degree and suitable experience in biochemistry and microbiology. Salary in the range £700–£750 p.a.

Applications should be sent not later than 14th December, 1957, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

UNIVERSITY OF MANCHESTER. Applications for the post of LECTURER IN OCCUPATIONAL HEALTH are invited from registered medical practitioners. Candidates should have had practical experience of industrial medicine or of research. Duties will include medical work in industry. Salary not less than £1750 p.a. with membership of the F.S.S.U. and children's allowance scheme.

Applications should be sent not later than 14th December, 1957, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

Hospital Services: Senior Appointments

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as part-time CONSULTANT in Diagnostic Radiology to undertake 9 notional half-days a week in the Woolwich group of hospitals. Duties may include some sessions associated with the Regional Neurological/Neurosurgical and Thoracic Surgical Units at the Brook General Hospital. Candidates must have had a wide experience in the speciality and hold an appropriate diploma. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to: The Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 14th December, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. THORACIC SURGEONS are invited to apply for a vacancy of 4 sessions to work at Brook Hospital, Shooters Hill-road, Woolwich, S.E.18, and at Preston Hall, Maidstone. The surgery of both tubercular and non-tubercular diseases is undertaken. Candidates must be Fellows of a Royal College of Surgeons and have had considerable experience in thoracic surgery. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and war service, together with the names and addresses of 3 referees, to The Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 14th December, 1957.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of Part-time SENIOR HOSPITAL MEDICAL OFFICER to the Department of Psychiatry. The post is renewable each year. Candidates who possess the Diploma in Psychological Medicine will be preferred, and the successful candidate will be required to attend at least 2 and possibly 4 half-days weekly.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 9th December, 1957. H. BRIERLEY, House Governor.

ROYAL MASONIC HOSPITAL, Ravenscourt Park, London, W.6. Applications are invited from Fellows of 1 of the Royal Colleges of Surgeons for the appointment of CONSULTANT SURGEON at the above Hospital as from 1st April, 1958. Candidates must be engaged in consulting practice and well established in their profession.

Applications, giving detailed information and the names and addresses of 3 referees, should reach the undersigned (from whom further information may be obtained) on or before 21st December, 1957.

R. E. LAWSON, Secretary and House Governor.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, London, W.1. Applications are invited for the appointment of Part-time CONSULTANT ANÆSTHETIST (5 sessions). Duties to commence 19th May, 1958.

Applications, stating age, qualifications and details of present and previous experience, with names of 3 referees, to be addressed to the House Governor, from whom further particulars can be obtained, by 4th January, 1958.

BRISTOL CLINICAL AREA. SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of OPHTHALMOLOGIST in the Bristol Clinical Area. The appointment will be on a whole-time basis in the Senior Hospital Medical Officer grade. The main duties of the appointment will be concerned with the School Eye Service but an opportunity may be given for the successful candidate to undertake regular work at the Bristol Eye Hospital.

Applications (12 copies), stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 21st December, 1957.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for appointment as CONSULTANT OTORHINOLARYNGOLOGIST for 7 notional half-days a week. The duties comprise 4 notional half-days a week in The United Liverpool Hospitals, in the first instance at the Liverpool Ear, Nose, and Throat Infirmary, where the post will be of junior status, and 3 notional half-days a week with the Liverpool Regional Hospital Board, in the first instance at Clatterbridge Hospital (2 notional half-days) and Aintree Hospital (1 notional half-day). Candidates must possess a registrable qualification and either F.R.C.S. (England, Edinburgh or Ireland) and the D.L.O. or F.R.C.S. in Otology.

Applications, giving full particulars of age, qualifications, &c., and details of present and previous appointments, together with the names of 3 persons to whom reference may be made, should reach the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1, by 21st December, 1957.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for appointment as CONSULTANT OPHTHALMOLOGIST to take up duty in April, 1958. The appointment is for 4 notional half-days a week for duty primarily at St. Paul's Eye Hospital and will be of junior status. Candidates must possess a registrable qualification and either F.R.C.S. (England, Edinburgh or Ireland) and a special Diploma in Ophthalmology or F.R.C.S. in Ophthalmology.

Applications, giving full particulars of age, qualifications, &c. and details of present and previous appointments, together with the names of 3 persons to whom reference may be made, should reach the Secretary, 80, Rodney-street, Liverpool, 1, by 31st December, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PATHOLOGISTS (Senior Hospital Medical Officer grade) to :—

(i) Preston and Chorley Group of hospitals, mainly at Preston Royal Infirmary.

(ii) Oldham and District Group of hospitals, mainly at the Oldham and District General Hospital.

Experience in all branches of hospital pathology desirable; successful candidates will work under the general guidance of consultants and will be required to live near their main hospitals.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 16th December, 1957.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CONSULTANT RADIOLOGIST, 5 half-days a week, Ashford Hospital, Ashford, Middlesex (562 Beds), and Hounslow Hospital, Hounslow, Middlesex (81 Beds). Hospitals may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, before 30th December, 1957.

OXFORD REGIONAL HOSPITAL BOARD. Assistant PHYSICIAN (geriatrics) (Senior Hospital Medical Officer grade). Whole-time to work under the supervision of the Consultant Physician (geriatrics) in the Buckinghamshire Area. Duties at Amersham General Hospital (102 chronic sick beds), also at High Wycombe (33 Beds) and Aylesbury (79 Beds). Candidates should have good experience in general medicine as well as a special interest in geriatrics. A higher qualification would be an advantage. Present holder has obtained Consultant appointment and post will be available 15th February.

Further information from the Secretary, Oxford Regional Hospital Board, 43, Banbury-road, Oxford, to whom applications (12 copies), stating age, qualifications, &c., and names of 3 referees, should be sent by 28th December.

SCOTLAND. NORTH EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the full-time post of Locum CONSULTANT GENERAL SURGEON, Shetland, in charge of the Gilbert Bain Hospital, Lerwick. The successful applicant would be expected to take up duty on or before 19th December for a period of approximately 6 weeks.

Applications, together with the names of 2 referees, should be forwarded as soon as possible to the Senior Administrative Medical Officer, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Temporary Whole-time ASSISTANT BACTERIOLOGIST at Ayrshire Central Hospital, Irvine, and with duties in the Ayrshire area. The appointment is for a period of 2 years. Salary (at age 32 and over) on the scale £1653 15s.–£52 10s.–£2126 5s.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of ASSISTANT DERMATOLOGIST based at the Western Infirmary, Glasgow. The appointment will be whole-time or on the maximum part-time basis of 9 sessions per week. Salary (at age 32 and over) on the scale £1653 15s.–£52 10s.–£2126 5s.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time SENIOR HOSPITAL MEDICAL OFFICER in Geriatrics in the Geriatric and Rehabilitation Unit, Killearn Hospital. Salary (at age 32 and over) on the scale £1653 15s.–£52 10s.–£2126 5s.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required at the Middlewood Hospital, Sheffield. Salary scale, £1653 15s.–£52 10s.–£2126 5s. p.a.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 28th December, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOLOGIST for Leicester Royal Infirmary and Leicester General Hospital. The successful candidate will work under the direction of the Consultant Radiologist in Charge and will be required to reside within 10 miles of Leicester Royal Infirmary. Candidates should possess a diploma in Radiology. Salary scale £1653 15s.–£52 10s.–£2126 5s. p.a.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 28th December, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT RADIOLOGIST required. Duties mainly in hospitals in the Mansfield area.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 21st December, 1957.

WELSH REGIONAL HOSPITAL BOARD. Whole-time SENIOR CASUALTY OFFICER required at Caerphilly District Miners' Hospital, in the Rhymney and Sirhowy Valleys Hospital Management Committee area. Vacant on 1st January, 1958. Commodious family flat at reasonable rent. Salary within range of £1653 15s.–£2126 5s. Tenure of appointment for a period not exceeding 4 years.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time SENIOR CASUALTY OFFICER required at Barry Accident and Surgical Hospital. Person appointed will be required to undertake duties under general supervision of consultant surgeon and visiting consultants. Salary within range of £1653 15s. to £2126 5s. Tenure of appointment for a period not exceeding 4 years.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Consultant in General Medicine to Llanelly and Bryntirion Hospitals in the Glantawe Hospital Management Committee area. Charge of acute medical and chronic sick beds. Duties will also include care of sick children. Successful candidate required to reside in Llanelly. Optional whole-time maximum part-time appointment.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer), Morgannwg Hospital, Bridgend, Glamorgan. Accommodation available for single or married persons. Hospital possesses Neurosis Centre, Child Guidance Clinic, Psychological Department, extensive Outpatient Clinics, well-equipped Pathological and Electroencephalographic laboratories and social clubs.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT ORTHOPÆDIC AND TRAUMATIC SURGEON required Clwyd and Deeside Hospital Management Committee area for approximately 1 month.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

B.W.I. UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES. The Board of Management invites applications for the appointment of RADIOLOGIST at the above Teaching Hospital. The salary for the appointment will be £2300 p.a. together with an allowance at present at the rate of £250 p.a. from the University College in respect of teaching duties, and there are opportunities for limited consultant practice. A contract will be offered for 3 years in the first instance, subject to renewal, and passages will be provided for the successful candidate and his family on appointment and on termination of contract. Unfurnished accommodation will be provided for which a rental of 5 % of salary will be charged. The appointments are full-time and the holder of the post will be required to contribute 5 % of his salary to the Hospital's superannuation scheme.

Applications (6 copies), stating full details of qualifications, present appointment and previous experience, together with the names and addresses of 3 referees, should be sent not later than 31st December, 1957, to the Secretary to the Senate Committee on Colleges Overseas in Special Relation, University of London, Senate House, London, W.C.1, from whom further information may be obtained.

NEW ZEALAND. NORTHLAND HOSPITAL BOARD. Part-time MEDICAL SUPERINTENDENT, Rawene Hospital, and DIRECTOR, Hokianga Special Area Medical Service. Applications are invited from qualified medical practitioners for the above combined position. A free house is available. The present salary payable is in the range of £2140–£2240. Travelling expenses are also payable. Some surgical experience is desirable.

Conditions of appointment available from the High Commissioner, New Zealand House, London, or the undersigned, with whom applications close on 30th December, 1957.

The Secretary, Northland Hospital Board.

P.O. Box 403, Whangarei, New Zealand.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD, DUNEDIN, NEW ZEALAND. Applications are invited for the position of DIAGNOSTIC RADIOLOGIST, Otago Hospital Board. Applicants must hold a degree in medicine of an approved university and possess a higher qualification in the specialty. The salary payable will be that of a Junior or Senior Specialist under the Hospital Employment Regulations, viz., £1640–£2340 p.a. The commencing salary will be determined in accordance with the qualifications and experience of the appointee. The position is a full-time and non-resident one. Travelling expenses as set out in the conditions of appointment will be paid when a contract of service is signed. Conditions of appointment and application forms may be obtained from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2, or from the office of the High Commissioner for New Zealand, 415, The Strand, London.

Applications, stating, age, qualifications and experience, together with testimonials, health and radiological certificates, will be received by the undersigned until 10 A.M. on Monday, 3rd February, 1958. W. A. WILLIAMSON, Secretary.

Otago Hospital Board, P.O. Box 946, Dunedin, N.Z.

Hospital Services: Junior Appointments

ANNIE McCALL MATERNITY HOSPITAL, Jeffreys-road, S.W.4. Applications are invited from registered Women medical practitioners for the post of RESIDENT OBSTETRIC HOUSE SURGEON (post recognised for the D.Obst.R.C.O.G.). Appointment is for a period of 6 months, vacant 2nd January, 1958.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of 3 recent testimonials, to the Secretary, not later than 14th December, 1957.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, E.2. HOUSE SURGEON, pre-registration post, vacancy 3rd January, 1958.

Applications, stating experience, and copies of 2 testimonials to Hospital Secretary.

BROMPTON HOSPITAL, S.W.3. Applications invited for the following posts :—

NON-RESIDENT SURGICAL OFFICER (post graded as Senior House Officer or Registrar, according to qualifications and experience) for 6 months from 1st February, 1958, with eligibility for reappointment. Candidates must have held a resident hospital appointment.

RESIDENT HOUSE PHYSICIAN (3 vacancies). 2 vacancies for 6 months from 1st February, 1958. Duties include work in Outpatient Department and wards. 1 vacancy for 9 months from 1st February, 1958. The first 3 months at Brompton Hospital Sanatorium, Frimley, and the following 6 months at the Hospital in London covering work in Outpatient Department and wards. Salary at the rate of £577 10s. p.a.

RESIDENT HOUSE PHYSICIAN to the Cardiac Department for 6 months from 1st February, 1958. Duties include work in Outpatient Department and wards. Salary at the rate of £577 10s. p.a.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 7th December, 1957, to KENNETH A. F. MILES, House Governor.

EASTMAN DENTAL HOSPITAL AND INSTITUTE OF DENTAL SURGERY (UNIVERSITY OF LONDON), Gray's Inn-road, London, W.C.1. Applications are invited for the full-time post of ANÆSTHETIST in the grade of Registrar. Remuneration and conditions of service in accordance with national scales.

Application forms should be obtained from the Director.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications for the 6 months' resident appointment, now vacant, of Pre-registration HOUSE PHYSICIAN should be sent to Group Secretary, Hackney Hospital, E.9, quoting G.H.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) 2 HOUSE SURGEONS required for 6 months. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) Applications are invited for the post of SECOND CASUALTY OFFICER with duties in the Department of Orthopædic and Traumatic Surgery (Senior House Officer grade). Recognised for F.R.C.S. Salary £819 10s. p.a. less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

GUY'S MAUDSLEY NEUROSURGICAL UNIT. Applications are invited for the resident post of SENIOR HOUSE OFFICER for 6 months commencing on 1st February, 1958. The unit, which is housed in the Maudsley Hospital, serves both Guy's Hospital, and the Bethlem Royal Hospital and the Maudsley Hospital.

Applications should be made within 2 weeks of the appearance of this advertisement to K. J. Johnson, House Governor and Secretary, Maudsley Hospital, Denmark-hill, S.E.5.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the pre-registration post of NON-RESIDENT CASUALTY OFFICER (medical or surgical). Vacant 1st January, 1958, tenable for a period of 6 months.

Application forms may be obtained from the Secretary, to whom they should be returned, together with copies of 3 recent testimonials, by 5th December, 1957.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. HOUSE SURGEON, vacant 10th December. 50 surgical beds, new operating theatre, Outpatient and Casualty Department. Preference given to applicants seeking pre-registration post under Medical Act, 1950.

Applications, with copies of 3 testimonials and name and address of 1 referee, to Hospital Secretary.

HITHER GREEN HOSPITAL, Hither Green, London, S.E.13. HOUSE PHYSICIAN required 18th December for duties in infectious diseases and general medicine. Recognised pre-registration post.

Applications, with references from medical school, &c., to the Senior Physician.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE PHYSICIAN to become vacant on Wednesday, 1st January, 1958. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before Monday, 2nd December, 1957, together with copies of 3 recent testimonials.

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.5. Applications are invited for the post of REGISTRAR in the Psychological Medicine Department. The appointment is a full-time one, tenable from 1st January, 1958, and will be for 1 year in the first instance. The opportunity for post-graduate training is provided.

Applications, stating age, qualifications and experience and giving the names of 2 referees, should be sent to the undersigned not later than 14th December, 1957.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applica-tions are invited for appointment as CASUALTY OFFICER (Senior House Officer). Vacant 1st January, 1958. Post recognised for F.R.C.S. Successful candidate will be required to do locum duties from 25th December, 1957.

Forms of application from the Secretary.

LANGTHORNE HOSPITAL, London, E.11. Leytonstone (No. 10) HOSPITAL GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER in the Group Geriatric Unit at above Hospital. This post offers excellent scope for persons interested in this specialty, as the most modern methods of geriatric treatment are employed, supervised by a Consultant Geriatrician, with full consultant services in other branches.

Application forms from the Senior Medical Officer, Langthorne Hospital, London, E.11, to be returned by 9th December, 1957.

METROPOLITAN HOSPITAL. Kingsland-road, London, E.8. (General—146 Beds.) Applications are invited for the pre-registration posts of 2 HOUSE PHYSICIANS and 3 HOUSE SURGEONS, 4 posts vacant 1st January, 1958, and 1 House Surgeon post vacant 1st February, 1958.

Applications from provisional and fully registered candidates, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, to the Hospital Secretary by 11th December, 1957.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. 2 vacancies occur 1st February, 1958, for RESIDENT HOUSE PHYSICIAN. Appointment for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and post graded as House Officer. Duties include work in the Outpatient Department and special clinics, as well as in wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 20th December.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Accident and Orthopædic Department becoming vacant in February, 1958. A higher qualification, although desirable, is not essential, but experience in general surgery is necessary.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 12th December, 1957. H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1, has vacancy for CASUALTY OFFICER (graded Senior House Officer) becoming vacant on 1st January, 1958. The appointment is recognised for the F.R.C.S.

Applications (6 copies), together with 6 copies of 3 recent testimonials, should be received by the undersigned by 12th December, 1957. H. BRIERLEY, House Governor.

NEW END HOSPITAL, Hampstead, N.W.3. Department OF ENDOCRINOLOGY. Applications are invited for the position of HOUSE PHYSICIAN (pre-registration), vacant 18th January, 1958.

Application forms obtainable from Group Secretary, 46, Cholmeley-park, N.6, and returnable to Surgeon Superintendent, at New End Hospital by 10th December, 1957.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD.

ANÆSTHETIC REGISTRAR (resident), Poplar Hospital, East India Dock-road, E.14. Recognised for D.A. and F.F.A. R.C.S.

SURGICAL REGISTRAR (non-resident), Whipps Cross Hospital, Leytonstone, E.11. Recognised for 6 months' general-surgical training for F.R.C.S.

SURGICAL REGISTRAR (resident), St. Leonard's Hospital, Nuttall-street, N.1. Recognised for F.R.C.S.

SURGICAL REGISTRAR (resident or non-resident), St. Andrew's Hospital, Devons-road, Bow, E.3. Recognised for F.R.C.S.

MEDICAL REGISTRAR (non-resident), Queen Mary's Hospital for the East End, Stratford, E.15.

MEDICAL REGISTRAR (non-resident, near Hospital), Whipps Cross Hospital, Leytonstone, E.11.

ORTHOPÆDIC REGISTRAR (resident or non-resident), Southend General Hospital, Southend-on-Sea, Essex. Recognised for F.R.C.S.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 14th December.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. Applications are invited for the post of RESIDENT SENIOR HOUSE PHYSICIAN (Senior House Officer grade) for 6 months. Post vacant end December. Opportunity to serve for a further 6 months as Obstetric/Gynæcological House Surgeon or Casualty/Anæsthetics Officer in the same grade.

Applications, stating age, qualifications, &c., to the House Governor, with 3 testimonials, not later than 6th December, 1957.

PUTNEY HOSPITAL, Lower Common, S.W.15. House PHYSICIAN (resident), male or female, with some gynæcological duties. Vacant 1st January, 1958. Open to pre-registration candidates.

Apply Hospital Secretary not later than 3rd December, 1957, enclosing copies of 3 recent testimonials.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD, SURREY. 2 HOUSE OFFICER appointments :—

(i) For 2 consecutive periods of 6 months commencing 1st February, 1958. First period House Physician, Hackney-road, second period House Surgeon, Hackney-road and Casualty Officer, Shadwell.

(ii) For 6 months from 1st February, 1958, as House Physician, Hackney-road.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned with copies of not more than 3 testimonials, not later than 14th December, 1957.

QUEEN MARY'S (ROEHAMPTON) HOSPITAL, London, S.W.15. (386 Beds.) SENIOR HOUSE OFFICER (surgical) required. National Health Service terms and conditions.

Apply Medical Superintendent.

ROYAL FREE HOSPITAL. Department of Physical MEDICINE AND RHEUMATOLOGY. Applications are invited from registered medical practitioners for the appointment of REGISTRAR to the above Department. The appointment is full-time, non-resident and for 1 year in the first instance. Duties to commence on 1st February, 1958. Salary and conditions of service in accordance with those laid down by the Ministry of Health.

Application forms may be obtained from the Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 13th December, 1957.

ROYAL FREE HOSPITAL GROUP. Applications are invited from either Men or Women medical practitioners for the appointment of ANÆSTHETIC REGISTRAR (resident). Applicants must be not more than 10 years qualified. The appointment is for 1 year in the first instance, duties to begin on 1st January, 1958. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Application forms may be obtained from the Hospital Secretary, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 5th December, 1957.

ROYAL NATIONAL THROAT, NOSE AND EAR HOS-PITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1, in association with the INSTITUTE OF LARYNGOLOGY AND OTOLOGY. Applications are invited for a post of REGISTRAR or alternatively SENIOR HOUSE OFFICER. A higher surgical qualification is required for the former grading and at least the primary F.R.C.S. for the latter. Considerable clinical experience in general surgery and in this specialty is required for either post. The appointment will be in accordance with the terms and conditions of service for the appropriate grade in the National Health Service.

Applications, giving full information and the names of 2 referees, should be sent to the House Governor by 13th December, 1957.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Appli-cations are invited for the post of HOUSE PHYSICIAN (post-or pre-registration). Vacant 27th December, 1957.

Applications, with copies of recent testimonials, to be sent to the Hospital Secretary by 7th December, 1957.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1, and Brockley Hill, STANMORE, MIDDLESEX. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (3 vacancies) for a period of 6 months, 2 to commence duties at Great Portland-street on 3rd February, 1958, and 10th March, 1958, and 1 to commence duties at the Country Hospital, Stanmore, on 29th January, 1958.

Applications, stating preference, to be received by 17th December, 1957. Forms of application can be obtained from the House Governor at 234, Great Portland-street, W.1.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Brock-ley Hill, STANMORE, MIDDLESEX. Applications are invited for the post of Whole-time REGISTRAR in Anæsthetics (resident). Duties to commence 1st February, 1958.

Applications, with names of 3 referees, to be addressed to the House Governor, 234, Great Portland-street, London, W.1, by 17th December.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. HOUSE PHYSICIAN (registered or pre-registration) required at the above Hospital. Combined tuberculosis and acute medicine. Post vacant 22nd December, 1957.

Form of application from the Secretary, to be returned by 7th December, 1957.

ST. GILES' HOSPITAL, Camberwell, S.E.5. Applications invited for appointment to the post of SENIOR HOUSE OFFICER (casualty duties), vacant from 1st January, 1958. Recognised for F.R.C.S.

Apply, giving age, qualifications and experience, with copy testimonials or names of 2 referees, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, not later than 10th December, 1957.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. Applications are invited from registered or provisionally registered medical practitioners for the separate posts of HOUSE SURGEON and HOUSE PHYSICIAN for 6 months.

Applications, with 2 recent testimonials, to the Hospital Secretary by 6th December, 1957.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a Part-time RESEARCH WORKER in Juvenile Psychosis for a period of 1 year, part-time Medical Officer grading.

Further particulars and forms of application, which must be returned by 31st December, may be obtained from the undersigned. H. F. RUTHERFORD,

House Governor and Secretary.

WANSTEAD HOSPITAL, Hermon Hill, London, E.11. (191 Beds.) HOUSE SURGEON required, post vacant 24th December, 1957. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WESTMINSTER CHILDREN'S HOSPITAL. WEST-MINSTER HOSPITAL TEACHING GROUP. CASUALTY OFFICER required for 6 months from 1st February, 1958. Grade, House Officer (post-registration) or Senior House Officer, dependent on experience. Pædiatric experience preferred.

Applications, with copies of testimonials, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 7th December.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (No. 10) HOSPITAL GROUP. Applications are invited from fully registered medical practitioners for the post of HOUSE OFFICER in the Geriatric Unit at above Hospital. This post, vacant 14th January, 1958, offers excellent scope for persons interested in this specialty, as the most modern methods of Geriatric treatment are employed.

Application forms from the Hospital Secretary, to be returned by 9th December, 1957.

WHIPPS CROSS HOSPITAL, London, E.11. Applica-tions are invited for the post of Pre-registration HOUSE PHYSICIAN (general medicine) which becomes vacant on 14th January, 1958.

Application forms from the Hospital Secretary, to be returned by 9th December, 1957.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. RESIDENT CASUALTY OFFICER required 26th December. Senior House Officer post, recognised for Fellowship. RESIDENT HOUSE PHYSICIAN required 27th December. Pre-registration candidates eligible. 6 months' appointments.

Applications, with full particulars, to Hospital Secretary by 11th December.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pathology). Vacant 1st January. The appointment is to the Group laboratories and is for 1 year. Salary £819 10s. p.a., less £150 p.a. if resident.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ALTRINCHAM GENERAL HOSPITAL. Assistant Senior SURGICAL OFFICER (Junior Hospital Medical Officer grade). Applications are invited for this post in a Hospital of 130 acute beds with a busy Casualty Department. The appointee would be required to exercise control of this Department and also to assist Resident Surgical Officer with the general surgical work of the Hospital. The post offers excellent opportunities of practical experience and postgraduate study to suitably qualified candidates and particularly those studying for higher surgical qualifications.

Applications, with names of 2 referees, to Group Secretary, North and Mid-Cheshire Hospital Management Committee, Sinderland-road, Altrincham, Cheshire.

ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the pre-registration post of JUNIOR HOUSE OFFICER (surgical).

Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the pre-registration post of JUNIOR HOUSE OFFICER (medical), vacant February, 1958.

Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

ALTRINCHAM GENERAL HOSPITAL. St. Anne's E.N.T. DEPARTMENT, ALTRINCHAM, CHESHIRE. (53 Beds.) REGISTRAR required (preferably resident). Vacant January, 1958. This post offers excellent opportunities of practical experience and is recognised under F.R.C.S. regulations.

Applications to be forwarded, with names of 2 referees, to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

ASCOT, BERKSHIRE. HEATHERWOOD ORTHO-PÆDIC HOSPITAL. ORTHOPÆDIC REGISTRAR required February. Hospital is a regional centre for all general orthopædic conditions, including fractures, and performs a large amount of outpatient work. Post recognised for F.R.C.S.

Application forms from and returnable to Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 14th December.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON for general surgical duties. 6 months' appointment, vacant in early December, 1957. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for Casualty Department, Ashton-under-Lyne General Hospital. Appointment limited to 4 years. Minimum commencing salary £852 10s. p.a., but higher salary may be paid according to experience and qualifications. There may be some orthopædic duties to be undertaken by the holder of this post. Recognised under F.R.C.S. regulations.

Apply, giving age, experience, qualifications and 2 references, to Group Secretary, General Hospital, Ashton-under-Lyne.

AYLESBURY, BUCKINGHAMSHIRE. TINDAL GEN-ERAL HOSPITAL. (257 Beds.) HOUSE SURGEONS (2 required) (Male or Female). Pre-registration posts, but registered practitioners invited to apply. The posts offer wide experience of general surgery with operative practice; recognised for F.R.C.S. Vacant 9th December, 1957, and 20th December, 1957. The acute surgical unit consists of 91 Beds. No casualty department.

Apply, with copies of 2 testimonials, to the Administrative Officer.

BARNSLEY. BECKETT HOSPITAL. (174 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT MEDICAL REGISTRAR required 1st February. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 9th December, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration); vacant now. The Hospital serves a wide area of pleasant countryside and the post affords good opportunity to study excellent clinical material.

Apply to Group Secretary, 19, Alexandra-road, Barnstaple.

BARNSTAPLE. NORTH DEVON INFIRMARY (Central Group Hospital of 105 Beds). SENIOR HOUSE SURGEON. Post vacant 13th January, 1958, for 1 year. Salary £819 10s. p.a. Furnished flat available for rental.

Applications, with customary details, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEDFORD GENERAL HOSPITAL. (436 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required for busy acute Orthopædic and Traumatic Department at above Hospital. Previous orthopædic experience desirable. Candidates may visit the Hospital by appointment with the Group Secretary.

Application forms obtainable from and returnable to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 9th December, 1957.

BEDFORD GENERAL HOSPITAL. (436 Beds.) Ortho-PÆDIC HOUSE SURGEON required. Vacant now. Pre- or post-registration ; recognised for F.R.C.S. Post offers wide experience in a busy specialist orthopædic and traumatic unit.

Inquiries and applications, with copies of 2 recent testimonials, to be sent immediately to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE PHYSICIAN (House Officer or Senior House Officer grading according to experience).

Apply Group Secretary.

BIRMINGHAM, 13. SORRENTO MATERNITY HOS-PITAL. (106 Beds, including 24 premature baby cots.) OBSTETRIC HOUSE SURGEON. Appointment recognised for D.Obst.R.C.O.G. Hospital affiliated to Birmingham Medical School for training of students. Vacant 1st February, 1958.

Applications to the Obstetrician, Sorrento Maternity Hospital, not later than 16th December.

BIRMINGHAM (near). MIDLAND CENTRE FOR NEUROSURGERY, Holly-lane, SMETHWICK, near BIRMINGHAM. RESIDENT SENIOR HOUSE OFFICER, vacant 1st January, 1958. This is a new Hospital entirely devoted to Neurology and Neurosurgery, within easy reach of Birmingham. Salary on national scale less deduction for board, lodging, &c.

Applications, with names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29**

REGISTRAR (orthopædic). Now vacant for Royal Orthopædic Hospital, Birmingham. F.R.C.S. desirable—experience in orthopædic surgery. Resident.

(2) **South Warwickshire Group, 50, Holly-walk, Leamington Spa**

REGISTRAR (psychiatry). Outpatients (adults and children) at Coventry, Nuneaton and Rugby Hospitals (7 sessions); 4 inpatient sessions at Central Hospital, near Warwick, with Electo-encephalographic Department. Occupational therapy and all modern treatments, also neurosis unit now excluded from the Lunacy and Mental Treatment Acts. House available.

(3) **Coventry No. 20 Group, Coventry and Warwickshire Hospital, Coventry**

REGISTRAR (gynæcology and obstetrics), George Eliot Hospital, Nuneaton. Recognised M.R.C.O.G. Resident. Experience in specialty essential. Higher qualification desirable.

(4) **West Bromwich Group, Edward-street, West Bromwich**

REGISTRAR (anæsthetics). Duties at Midland Centre for Neurosurgery, Smethwick Hospital and other Group hospitals. Experience specialty required. Married quarters available.

Application forms from Group Secretaries, to be returned by 9th December, 1957.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (Equipped beds 955.) Applications are invited for the following posts:—

4 HOUSE PHYSICIANS.
1 HOUSE PHYSICIAN (pædiatrics). Recognised for D.C.H. Some duties at Moseley Hall Hospital for Children.
3 HOUSE SURGEONS. Recognised for F.R.C.S.
2 HOUSE SURGEONS (gynæcology and obstetrics). Recognised for M.R.C.O.G.

The above posts will be available on or about 14th January, 1958, and are recognised for pre-registration service.

Apply to the Medical Superintendent, giving qualifications, age and experience, and enclosing copies of 3 testimonials. Closing date, 14th December, 1957.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. HOUSE OFFICERS (surgical) required to commence duty on 7th January, 1958, for 6 months. The posts rotate during the period giving good experience of general and special surgery. Recognised for pre-registration students, but registered practitioners may apply.

Forms of application available from the House Governor, and should be returned to him by 7th December, 1957.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of MEDICAL REGISTRAR (non-resident) for the University Department of Pædiatrics and Child Health, vacant on 1st January, 1958. Postgraduate experience, including at least 6 months' pædiatric training is required. Preference will be given to candidates with a higher qualification.

Application forms are obtainable from the House Governor and should be returned to him by 14th December, 1957.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. PÆDIATRIC HOUSE PHYSICIAN (Male/Female). Post vacant 1st February, 1958. Recognised for D.C.H. Includes duties on Infectious Diseases Wards, Neonatal Department and Clinics.

Applications to the Physician-Superintendent.

BISHOP AUCKLAND. THE GENERAL HOSPITAL. HOUSE OFFICER (obstetrics and gynæcology). Applications invited from registered or pre-registration practitioners. Vacant 1st January, 1958. Recognised for D.Obst. R.C.O.G. Departmental beds 69.

Apply, naming 2 referees, to Group Secretary, South West Durham Hospital Management Committee at above address.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE.

Royal Infirmary, Blackburn

HOUSE SURGEONS (2) required for 25th January and 1st February, 1958. Posts recognised for F.R.C.S. and approved for pre-registration purposes.

HOUSE PHYSICIAN required for 23rd January, 1958. Post recognised for pre-registration purposes.

Queen's Park Hospital, Blackburn

HOUSE SURGEON required for 1st February, 1958. Post recognised for F.R.C.S. and approved for pre-registration purposes.

HOUSE PHYSICIANS (2) required for 1st February and 22nd February, 1958. Posts recognised for pre-registration purposes.

Victoria Hospital, Accrington

HOUSE PHYSICIAN required for 22nd January, 1958. Post recognised for pre-registration purposes.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (casualty and orthopædics) required immediately. Junior Hospital Medical Officer post can be for any period up to 4 years. Recognised for F.R.C.S.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required immediately. Post recognised for F.R.C.S. and approved for pre-registration purposes.

Applications to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pædiatrics) required 2nd January, 1958. Post recognised for D.C.H. and duties as laid down by Consultant Pædiatrician at Queen's Park Hospital and Royal Infirmary, Blackburn, Victoria Hospital, Accrington (general hospitals), and Park Lee Hospital, Blackburn (infectious diseases hospital).

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

Bolton District General Hospital (607 Beds)

RESIDENT SENIOR HOUSE OFFICER for general surgical duties. Vacant 20th December, tenable for 12 months and recognised for F.R.C.S.

RESIDENT HOUSE SURGEONS (2). Vacant 7th December and 8th February, tenable for 6 months and recognised under pre-registration service scheme. Also recognised for F.R.C.S.

The Royal Infirmary, Bolton (238 Beds)

RESIDENT HOUSE SURGEONS (3). Vacant 15th January, 16th January and 1st February, tenable for 6 months and recognised under pre-registration service scheme. Also recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery for the above Hospital group consisting of 15 hospitals with 1638 Beds. The post, which becomes vacant on 28th December, 1957, is tenable for 1 year in the first instance. The orthopædic work is conducted mainly at the 2 major hospitals in the group, viz., Royal Victoria Hospital, Bournemouth, and Poole General Hospital, Poole, with 100 orthopædic beds and large Outpatient Departments covering both traumatic and non-traumatic orthopædics in all branches, in children and adults.

Forms of application may be obtained from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, and must be returned to him completed within 7 days of the appearance of this advertisement.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. GENERAL HOUSE SURGEON (pre-registration intern) required for post vacant on 14th December. Appointment recognised for F.R.C.S. examination.

Applications to the Hospital Secretary.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer grade) required for 1 year with interchange of duties, by agreement, at the Brighton General Hospital and other specialised units within the Brighton and Lewes Group. Vacant 21st December. Post recognised for F.F.A.R.C.S., and D.A.

Applications, stating age, nationality and experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) 2 CASUALTY HOUSE SURGEONS required 28th December and 22nd January. Duties include work in orthopædic and traumatic unit. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. SENIOR CASUALTY OFFICER (Junior Hospital Medical Officer), non-resident, required mid-December, at the above Hospital. Recognised for F.R.C.S.

Applications as locum or for permanent post, stating usual particulars and the names of 2 referees, to the Administrative Officer.

BRISTOL (near). HAM GREEN HOSPITAL, Pill, near BRISTOL. Applications are invited for RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER in the Chest Diseases wards of the above Hospital. The Hospital is fully equipped for modern treatment of pulmonary tuberculosis and other diseases of the chest, including regular major thoracic surgery. Opportunity also for work in the Bristol Chest Clinic. Appointment 1 year, renewable. Post now vacant.

Applications, with testimonials and names of referees, to the Secretary, Ham Green Hospital, Pill, near Bristol.

BUXTON. DEVONSHIRE ROYAL HOSPITAL. (252 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER, vacant now. This Hospital is a large special hospital for the treatment and rehabilitation of all types of locomotor disorders. Duties are mainly medical and include work in the long-stay unit of the Manchester University Rheumatism Research Centre. The Hospital is recognised under the regulations for the Diploma in Physical Medicine, Part II, and the post also offers good medical experience.

Applications, stating age, experience and qualifications, together with the names of 2 persons for reference, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, immediately.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of REGISTRAR in the Orthopædic and Fracture Departments at the Cardiff Royal Infirmary, to commence duty as soon as possible. Non-resident.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

BRADFORD. ST. LUKE'S HOSPITALS. (Beds: maternity 125, gynæcology 105.) SENIOR HOUSE OFFICER (obstetrics/gynæcology) required for large combined unit. Recognised for D.Obst.R.C.O.G. and M.R.C.O.G. Excellent experience to be obtained.

Applications, with copy testimonials, to Secretary, Bradford Royal Infirmary.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. REGISTRAR (medical and infectious diseases) at Brookfields Hospital, Cambridge (residence available). This Hospital has 2 wards for infectious diseases, 1 for general medicine and 1 for tuberculosis and is the Poliomyelitis Centre for the south-west section of East Anglia. Appointment for 1 year in first instance, renewable for a second year.

Apply, with full particulars and names of 3 referees, to Secretary, Addenbrooke's Hospital, Cambridge, by 7th December, 1957.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (188 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædic and traumatic surgery) (recognised by the Royal College of Surgeons) which is now vacant. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, and names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON (post approved for pre-registration service), general surgery with duties in genitourinary. Vacant 1st January.

Applications, giving age, qualifications, &c., with copies of recent testimonials or the names of 2 referees, should be sent to the Secretary at above address.

CASTLEFORD, NORMANTON AND DISTRICT HOSPITAL. RESIDENT SURGICAL OFFICER (Senior House Officer grade) required. Married accommodation available. Post vacant early December, 1957.

Applications as soon as possible to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorkshire.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE PHYSICIAN, pre-registration post, to work in the general medical wards of the Hospital. Duties will commence mid-December.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON. Pre-registration post. The post offers good surgical experience. Recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Resident SURGICAL OFFICER (Senior House Officer grade). Duties commence 1st January, 1958. The appointment is recognised for training for the Fellowship of the Royal College of Surgeons.

Applications, stating age, nationality, qualifications and experience, together with recent testimonials, to be received not later than 10th December, by the Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHERTSEY. ST. PETER'S HOSPITAL (Late Botleys Park War Hospital). Locum HOUSE SURGEON (resident) required from 1st January, 1958–31st January, 1958.

Applications to Physician Superintendent, St. Peter's Hospital, giving names and addresses of referees.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) SENIOR HOUSE SURGEON (Deputy Resident Surgical Officer) required at above Hospital. Post recognised for F.R.C.S. Resident staff of 6—Resident Surgical Officer, 3 House Surgeons, Resident Medical Officer, and House Physician. Salary £819 10s. p.a., less residential charge. Vacant 28th December, 1957.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer.

CLACTON AND DISTRICT HOSPITAL, Clacton-on-Sea. (58 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DEWSBURY, YORKSHIRE. THE GENERAL HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgery and E.N.T.). The appointment is recognised for pre-registration.

Applications, stating age and experience, and giving names and addresses of 2 referees, to the Administrative Officer at the Hospital.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SENIOR HOUSE OFFICER (general medicine) vacant early January.

Applications, headed Post 2, stating full details and 2 names for reference, should be sent immediately to the Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (neuro-surgery) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fullwood-road, Sheffield, by 9th December, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SENIOR HOUSE OFFICER (general surgery) or HOUSE SURGEON (pre-registration) vacant mid-January. Recognised for F.R.C.S.

Applications, headed Post 1, stating full details and 2 names for reference, should be sent immediately to the Secretary.

DURHAM. COUNTY HOSPITAL. (116 Beds.) **Senior** HOUSE OFFICER in Orthopædics required immediately. Resident. The County Hospital is the main Orthopædic and Accident Hospital in a busy mining and industrial area. Experience can be obtained in all branches of orthopædics.

Applications, with particulars of previous experience and names of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

DURHAM. COUNTY HOSPITAL. (116 Beds.) **Resident** HOUSE SURGEON required in Orthopædics and Casualty. Post recognised for pre-registration purposes. This post offers facilities for good and varied experience in a busy orthopædic and accident hospital which serves a wide mining and industrial area.

Apply, giving age, experience and names of 2 referees, to the Group Secretary, Dryburn Hospital, Durham.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. ORTHOPÆDIC REGISTRAR, King's Lynn Hospital Group. Main hospitals: West Norfolk and King's Lynn General and St. James' Hospital, King's Lynn. Appointment for 1 year, renewable for second year. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, St. James' Hospital, King's Lynn.

REGISTRARS (2) in Obstetrics and Gynæcology, Norfolk and Norwich Hospital Group. Main hospital Norfolk and Norwich (441 Beds). Recognised for D.Obst.R.C.O.G. and M.R.C.O.G. Appointment for 1 year, renewable for second year. Candidates are invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 9th December, 1957.

EAST GRINSTEAD. QUEEN VICTORIA HOSPITAL. RESIDENT HOUSE OFFICER (Male or Female) required on 1st January, 1958, for General Hospital. Appointment for 6 months in first instance. Recognised for pre-registration purposes, and for F.R.C.S. examination.

Apply, stating age, experience, with names of 3 referees, to Hospital Secretary.

EAST KILBRIDE, LANARKSHIRE. HAIRMYRES HOSPITAL. (760 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (preferably resident) required now, to work in the Thoracic Surgical Unit (72 Beds) for tuberculous and non-tuberculous lung surgery, with certain duties in the sanatorium wards. Salary scale £852 10s.–£1182 10s. p.a., with deduction of £170 p.a. if resident.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to the Physician-Superintendent.

EBBW VALE HOSPITAL. (General beds 71, Maternity 15.) Applications are invited for the post of RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer grade). The Hospital is an active surgical unit and the Medical Staff consists of a Resident Consultant General Surgeon and visiting Orthopædic, Gynæcological and Ophthalmic Surgeons. The tenure of the appointment will be for a period not exceeding 4 years.

Apply, giving full details and references, to Group Secretary, North Monmouthshire Hospital Management Committee, Nevill Hall Hospital, Abergavenny, Mon.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Locum SENIOR HOUSE OFFICER for Casualty duties required 12th December, 1957, pending new appointment of Registrar status. Non-resident post. Hours: 9 A.M. to 5.30 P.M. Monday to Friday; 9 A.M. to 1 P.M. Saturday.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 28th January for Orthopædic, E.N.T., and Eye Departments. Pre-registration post recognised for F.R.C.S.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

EPSOM. THE MENTAL HOSPITALS GROUP LABORATORY. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for non-resident Whole-time REGISTRARS in Pathology (2 vacancies). The Laboratory affords excellent facilities for training and experience in all branches of pathology with opportunities for specialisation and research. In addition to working at the Laboratory, the persons appointed will be required to visit and work at the hospitals served by the Laboratory.

Application forms may be obtained from the Group Pathologist, Mental Hospitals Group Laboratory, at West Park Hospital, Epsom, from whom full information may be obtained and with whom an appointment to see the laboratory may be arranged. Closing date for application 9th December, 1957.

EPPING. ST. MARGARET'S HOSPITAL. House PHYSICIAN (pre-registration) to Consultant in General Medicine. Post vacant 15th January, 1958.

Applications, with copies of testimonials, 1 from medical school, to reach the Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 6th December, 1957.

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER (pathology). Post vacant 1st January, 1958. Busy department in large general hospital with easy access to London.

Applications, with names of 2 referees, to the Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 11th December, 1957.

EPPING. ST. MARGARET'S HOSPITAL. House Surgeon (pre- or post-registration) to very busy General Surgical Unit. Hospital within easy reach of Central London. Post vacant 15th January, 1958.

Applications, with copies of testimonials, including 1 from medical school, to reach the Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 6th December, 1957.

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER (medicine), resident post, duties to commence 15th January, 1958. Duties mainly general medical, experience in pædiatrics desirable.

Applications, with copies of 2 recent testimonials, to reach Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 13th December, 1957.

EXETER. ROYAL DEVON AND EXETER HOSPITAL invites applications from pre-registration and registered medical practitioners for the appointment of HOUSE PHYSICIAN. Vacant 27th January, 1958.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 7th December, 1957.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (E.N.T. Department—30 Beds). Vacant 11th February, 1958. The post is recognised for the F.R.C.S. examination.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 14th December, 1957.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (with duties as House Officer to the Neurologist). Vacant 1st February, 1958.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 14th December, 1957.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) SENIOR HOUSE OFFICER for Anæsthetics required. The holder can be resident or non-resident. Post is vacant on 1st January, 1958, and is recognised for the F.F.A. R.C.S. and includes some work at St. Luke's Hospital. Operations in main theatres totalled 4386 in 1956.

Apply, with full details of experience and copies of 3 testimonials, to the Hospital Secretary.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) CASUALTY OFFICER required. Post recognised for F.R.C.S. examination. Grading Senior House Officer. 2 Casualty Officers employed who share the work of the department, which is part of the orthopædic and traumatic unit. Regular instruction given in traumatic surgery and Casualty Officers take part in the work of fracture clinics. Post vacant 9th December.

Applications, with copies of 2 testimonials, to the Hospital Secretary as soon as possible.

GLASGOW. ROBROYSTON HOSPITAL (Maternity Unit). Applications are invited from registered general practitioners for posts as RESIDENT HOUSE OFFICERS in the Maternity Unit for the 6 months commencing 1st February, 1958. The Maternity Unit is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. Salaries and conditions of service according to Whitley Council recommendations.

Applications should be forwarded to Physician Superintendent, Robroyston Hospital, Glasgow, E.3.

GLASGOW. THE EXECUTIVE COUNCIL FOR THE CITY OF GLASGOW AND THE BOARD OF MANAGEMENT FOR GLASGOW VICTORIA HOSPITALS. Applications are invited for 2 joint appointments as Part-time Trainee GENERAL PRACTITIONER and Part-time SENIOR HOUSE OFFICER in General Medicine at the Victoria Infirmary. The appointments will be for 2 years and the successful applicants will spend part of each day in the general medical work of the Victoria Infirmary and part as a Trainee General Practitioner with a selected principal. The salary for the posts will be £819 10s. for the first year and £850 for the second year. A car allowance may be payable in addition.

Applications, with names of 2 referees, should be sent to the Secretary and Treasurer, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1, forthwith.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the acute Geriatric Unit (70 Beds—for assessment and rehabilitation) supervised by a Consultant Physician specialising in geriatrics. The appointment offers excellent clinical experience in the diagnosis and treatment of acute and other illnesses in the elderly and will be for 2 years in the first instance.

Applications, stating age, qualifications and experience, with the names of 2 referees, to be sent to the Medical Superintendent.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. Dermatology Unit (118 Beds). Applications are invited for the post of HOUSE OFFICER (recognised for pre-registration) for the 6 months beginning 1st February, 1958.

Applications should be addressed to the Medical Superintendent, giving the names of 2 referees.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. E.N.T. Unit (70 Beds). Applications are invited for the post of HOUSE OFFICER (recognised for pre-registration) for the 6 months beginning 1st February, 1958.

Applications should be addressed to the Medical Superintendent, giving the names of 2 referees.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. Acute Geriatric Unit (70 Beds.) Applications are invited for the post of HOUSE OFFICER (recognised for pre-registration) for the 6 months beginning 1st February, 1958.

Applications should be addressed to the Medical Superintendent, giving the names of 2 referees.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. Applications are invited for the post of HOUSE OFFICER in Anæsthetics, commencing 1st February, 1958, and should be addressed to the Medical Superintendent, giving the names of 2 referees.

HASLEMERE AND DISTRICT HOSPITAL. (82 Beds.) GUILDFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (surgical, with charge of 12 acute medical beds). Duties to commence 1st January, 1958. Valuable experience in general and emergency surgery, orthopædic, E.N.T., gynæcological, children and casualty work.

Applications to Hospital Secretary, Haslemere and District Hospital, Haslemere, Surrey, immediately with names of 3 referees.

HASTINGS HOSPITAL MANAGEMENT COMMITTEE. Locum ORTHOPÆDIC REGISTRAR required for whole-time duties from first week in December, 1957. Remuneration £19 5s. per week. Non-resident.

Apply, giving details of qualifications and experience, to Group Secretary, 11, Holmesdale-gardens, Hastings, as soon as possible.

HASTINGS GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required for duties within the Group. Married quarters available if required. Post vacant early January, 1958, is recognised for F.F.A. R.C.S. and D.A. Salary £819 10s. p.a.

Apply to Group Secretary, 11, Holmesdale-gardens, Hastings, giving details of qualifications, experience and names of referees.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the post of HOUSE SURGEON (pre-registration), vacant on 30th November, 1957. This Hospital is the main surgical hospital in the Hastings area and the post offers excellent experience.

Apply immediately, with 2 testimonials or names of 2 referees, to the Administrator of the Hospital.

HEMEL HEMPSTEAD. WEST HERTS HOSPITAL. (169 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required at above Hospital, which may be visited by direct appointment.

Application form obtainable from and returnable to Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 9th December, 1957.

HEMEL HEMPSTEAD. WEST HERTS HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR required at above Hospital. New post. Application made for recognition by Faculty.

Application forms obtainable from and returnable to Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by 10th December, 1957.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Pædiatrician and Ophthalmic Consultant. Salary £819 10s. p.a., less £150 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence 9th December, 1957.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds—Hospital situated 21 miles from London.) Applications are invited for the undermentioned appointments :—

HOUSE SURGEON (general), first or second post, to commence soon as possible.

HOUSE SURGEON (general, gynæcology and obstetrics), first or second post, to commence 13th December, 1957, or as soon after that date as possible

Pre-registration posts ; recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HILLINGDON HOSPITAL. Uxbridge, Middlesex. (621 Beds.) HOUSE SURGEON for Ophthalmic and E.N.T. Departments.

Apply, stating age, qualifications, nationality, experience and enclosing copies of not more than 3 recent testimonials, to Medical Director by 9th December.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duty immediately. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (235 Beds.) Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade) at the above Hospital, to commence duties on 4th December, 1957. The Group Geriatric Admission Unit is based on this Hospital, which also caters for acute medical and surgical, pædiatric and maternity patients. Salary in accordance with the terms and conditions of service for hospital medical and dental staff, £852 10s.–£55–£1182 10s. p.a. House available for married candidate.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in casualty and orthopædic surgery required. Post recognised for F.R.C.S. and is vacant 1st January, 1958. Salary £819 10s. p.a., with deduction of £150 p.a. for board residence, &c.

Apply to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. Senior HOUSE OFFICER in Anæsthetics required. Post recognised for D.A. Salary £819 10s. p.a. less £150 p.a. for board-residence.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. NORTHOWRAM HALL HOSPITAL. (106 Beds.) SENIOR HOUSE OFFICER in Chest Diseases required. Post vacant December, 1957. Duties include attendance at busy Chest Clinic at the Royal Halifax Infirmary and non-tuberculosis chest ward work. This post offers excellent facilities for a study of chest diseases and experience is available with bronchoscopies and bronchograms. Salary £819 10s. p.a., with a deduction of £150 p.a. for board residence, &c.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

IPSWICH. FOXHALL HOSPITAL. (102 Beds for chest diseases.) SENIOR HOUSE OFFICER. The Hospital is actively engaged in the investigation and treatment of all forms of chest disease, including major thoracic surgery and a respiratory function unit. House available.

Applications, with copies of recent testimonials, to Physician-Superintendent, from whom further details may be obtained.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-road wing), IPSWICH. (280 Beds.) Applications invited for post of NON-RESIDENT CASUALTY OFFICER (Senior House Officer), vacant immediately. Day-time duties only, offering opportunity of study for higher examinations.

Applications, with full details, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-road wing), IPSWICH. (280 Beds.) Post of HOUSE PHYSICIAN (pre-registration) now vacant.

Applications, stating qualifications, age, nationality, &c., with copies of 3 recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL, (Heath-road wing), IPSWICH. (280 Beds.) Applications invited for 2 posts of HOUSE SURGEON, pre-registration, to general surgeons. Posts become vacant on 7th and 17th January, 1958, and are recognised for F.R.C.S. examination.

Detailed applications, with copies of recent testimonials, to Hospital Secretary.

IRVINE. AYRSHIRE CENTRAL HOSPITAL. Resident JUNIOR HOSPITAL MEDICAL OFFICER required 1st December, Infectious Diseases Unit. House may be available.

Applications, stating qualifications and experience and giving names of 2 referees, to Area Medical Superintendent, 1, Hill-street, Kilmarnock.

ISLEWORTH. WEST MIDDLESEX HOSPITAL (South Middlesex Hospital Surgical Annexe). HOUSE SURGEON (pre-registration), Surgical Annexe of West Middlesex Hospital at South Middlesex Hospital (30 Beds). Duties include some assistance on Infectious Diseases Unit. Post vacant 11th December.

Applications, stating age, qualifications and experience, with copies of up to 2 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 9th December.

ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident) required as House Surgeon and to assist Casualty Officer. Salary £819 10s. p.a.

Applications, with names of 2 referees, to Hospital Secretary, Royal I.W. County Hospital, Ryde, by 14th December.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKS. (General—139 Beds.) RESIDENT HOUSE SURGEON (either sex). General surgery and E.N.T., vacant now. Recognised for F.R.C.S. and approved pre-registration appointment, tenable for 6 months in first instance. 4 residents on staff.

Applications, with full particulars as at age, nationality and qualifications, and copies of 2 testimonials, to Group Secretary, St. John's Hospital, Fell-lane, Keighley, Yorks.

KETTERING AND DISTRICT GENERAL HOSPITAL, KETTERING, NORTHANTS. Applications are invited for the undermentioned posts. Vacant 1st December, 1957.

HOUSE SURGEON (pre-registration). Post recognised for F.R.C.S.

HOUSE PHYSICIAN (pre-registration).

Applications, stating age, experience and qualifications, together with copies of 3 recent testimonials, should be sent to the Group Secretary, at above address.

KETTERING. ST. MARY'S HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in obstetrics and gynæcology at above Hospital, vacant early January, 1958. Previous experience is not necessary and the post would provide valuable experience in obstetrics and gynæcology for doctors intending to enter general practice at some future date.

Applications, giving particulars of qualifications and enclosing copies of 3 recent testimonials, should be sent to the Group Secretary, Kettering and District Hospital Management Committee, General Hospital, Kettering.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional mental hospital.) Applications are invited for the post of resident JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). Accommodation for a single medical officer but accommodation may possibly be available early in 1958 for a married applicant. Hospital recognised for D.P.M. and facilities granted for attending neighbouring universities. All modern methods of investigation and treatment carried out. Hospital serving North Lancashire and Lake District. Post for initial period of 4 years, but renewable if services satisfactory.

Apply Medical Superintendent.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (197 Beds.) HOUSE PHYSICIAN. Vacancy suitable for fully registered or pre-registration applicant. Post vacant.

Applications, with copies of 2 recent testimonials, to be sent to Hospital Secretary.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Infectious Diseases

Leeds Road Hospital, Bradford (120 infectious diseases beds). Resident.

General/Orthopædic Surgery

(i) Halifax Group (195 general surgical and 85 orthopædic beds). May include some duties in the Casualty Department. Preferably resident.

(ii) York A and Tadcaster Group. Resident or non-resident. Duties mainly at York County and City Hospitals. Aggregate of 110 general surgical and 70 orthopædic surgery beds. Duties divided between general and orthopædic surgery, may include some duties in the Casualty Department.

Orthopædic Surgery

Marguerite Hepton Memorial Orthopædic Hospital, Thorpe Arch, near Wetherby (78 long stay children's beds). A 3-bedroomed partly furnished house is available in the hospital grounds.

Rheumatism Research

The Leeds Regional Hospital Board, in association with the University of Leeds, invites applications for the post of REGISTRAR in Rheumatism, to assist the Professor of Clinical Medicine with research projects at the Royal Bath Hospital, Harrogate, which is the centre for the Regional Rheumatism Scheme, or elsewhere in the Region.

Thoracic Surgery

Regional Thoracic Centre, Pinderfields General Hospital, Wakefield (56 Beds). Recognised for F.R.C.S.

Applications, stating age (sex in the case of Registrar in Rheumatism Research), qualifications and details of present and previous appointments, with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 11th December, 1957.

LEICESTER GENERAL HOSPITAL. (454 Beds. Recognised for training for the F.R.C.S. examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 9th December, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LEICESTER ROYAL INFIRMARY. Applications are invited for the resident post of SENIOR HOUSE OFFICER to the E.N.T. Department, for a period of 12 months commencing 1st January. The post is recognised for the D.L.O. and F.R.C.S.

Applications, stating age, qualifications and experience, together with copies of recent testimonials, to the Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, forthwith.

LEICESTER. TOWERS MENTAL HOSPITAL. (1168 Beds.) Applications are invited for the whole-time post of JUNIOR HOSPITAL MEDICAL OFFICER. Salary £852 10s.–£55–£1182 10s. There is ample opportunity for experience in all branches of psychiatry including outpatient work and the Hospital is recognised for D.P.M. experience. Facilities for postgraduate training exist at Sheffield University. Resident accommodation is available for a single man, for which the appropriate charge will be made. Candidates must have completed their service with H.M. Forces.

Applications, giving age, nationality, and full details, with the names of 2 referees, to be sent to the Medical Superintendent as soon as possible.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. ROYAL LIVERPOOL CHILDREN'S HOSPITAL. Applications are invited for a post of REGISTRAR in Pædiatrics (cardiology) for the period to 30th September, 1958. Annual reappointment thereafter until completion of the normal period of training will be considered without need for further application.

Apply by 14th December, 1957, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL, 15. SEFTON GENERAL HOSPITAL. (995 Beds, 116 Cots.) Applications are invited for the following resident appointments which will become vacant at the above-named Hospital on 1st March, 1958, and will be for a period of 6 months. These posts are approved as pre-registration posts :—

6 HOUSE PHYSICIANS (general).
2 HOUSE PHYSICIANS (psychiatric).
3 HOUSE SURGEONS (general).
2 HOUSE SURGEONS (obstetric).
1 HOUSE PHYSICIAN (tropical).

The terms and conditions of service will be in accordance with the regulations of the Ministry of Health.

Application forms may be obtained from the undersigned, to whom they should be returned as soon as possible.

GARNET CHAPLIN Secretary,
South Liverpool Hospital Management Committee.

LUTON AND DUNSTABLE HOSPITAL (Children's ANNEXE), LUTON, BEDFORDSHIRE. RESIDENT PÆDIATRIC HOUSE OFFICER required end of December. The post is recognised for the D.C.H., and as a second pre-registration post in medicine. The duties cover both medical and surgical wards.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, as soon as possible.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE PHYSICIAN. 6 months' appointment. Post vacant mid-January, 1958. Salary at the rate of £467 10s.–£577 10s. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months' appointment. Post vacant mid-January, 1958. Salary at the rate of £467 10s.–£577 10s. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Salary £819 10s. p.a. less £150 p.a. for board and lodging. Post vacant February, 1958.

Applications to the Administrative Officer at the Hospital.

MAIDENHEAD HOSPITAL, Berkshire. Locum Surgical REGISTRAR required from 3rd December for some weeks.

Apply Secretary.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. RESIDENT SURGICAL REGISTRAR required.

Application forms from and returnable to Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 14th December.

MALVERN. ST. WULSTAN'S HOSPITAL. (230 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. Good experience in modern treatment of pulmonary tuberculosis. Work mainly medical but hospital has own Thoracic Surgical Unit.

Applications to Physician-Superintendent.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of RESIDENT SURGICAL OFFICER (Registrar grade) at the Christie Hospital and Holt Radium Institute. The post provides unique experience in the treatment of tumours and good opportunity for study.

Applications, with full details including the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the resident post of REGISTRAR for the Chest Unit at Monsall Hospital, Manchester. The unit comprises 96 tuberculous and 48 non-tuberculous beds and offers excellent experience in thoracic medicine and surgery. The appointment also includes duties at the outpatient clinic held at the Northern Hospital, Manchester.

Applications, stating age, present post, experience and names of 2 referees, to be forwarded immediately to the Secretary, Monsall Hospital, Newton Heath, Manchester, 10.

MANCHESTER REGIONAL HOSPITAL BOARD. Birch HILL HOSPITAL. REGISTRAR in Obstetrics and Gynæcology (resident) required immediately. Recognised for D.Obst.R.C.O.G.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

MANCHESTER REGIONAL HOSPITAL BOARD. Blackburn AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT REGISTRAR (obstetrics/gynæcology) required 1st February, 1958. Post recognised for Membership and D.Obst.R.C.O.G. (combined obstetrics and gynæcology). Based on Queen's Park Hospital, Blackburn, a large busy hospital with 58 obstetric and 29 gynæcology beds. Duties also at Royal Infirmary, Blackburn, and Victoria Hospital, Accrington.

Application forms available from and returnable to the Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. North AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR (Chest Diseases) required to carry out duties arranged by the Consultant Chest Physician at the Altrincham, Northwich, Crewe Chest Clinics and Hefferston Grange Sanatorium. Accommodation might be arranged, if necessary.

Applications, together with 2 recent testimonials, should be sent to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade). Candidates must have held house appointments but previous laboratory experience is not essential. The duties will consist of routine work in the Department of Clinical Pathology, mainly at Saint Mary's Hospitals, but the holder of the post will also spend some time in the Manchester Royal Infirmary.

Application to be made on forms obtainable from the undersigned and submitted by 6th December, 1957.

A. R. WISE, General Superintendent,
Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of SENIOR HOUSE OFFICER in Gynæcology. Applicants must have had previous hospital experience in medicine and surgery. The post is recognised for the purpose of the M.R.C.O.G. examination. The appointment is for 6 months starting 1st January, 1958. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned not later than 6th December, 1957.

A. R. WISE, General Superintendent,
Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. RESIDENT CASUALTY OFFICER (Registrar or Senior House Officer grade), to commence on 1st April, 1958. Whole-time post for 12 months. Surgical experience essential.

Application form obtainable from the Secretary, to be returned not later than 14th December, 1957.

MANCHESTER. UNITED MANCHESTER HOSPITALS. ROYAL INFIRMARY AND ROYAL EYE HOSPITAL, MANCHESTER, 13.
5 HOUSE PHYSICIANS.
HOUSE PHYSICIAN for Department of Cardiology.
HOUSE PHYSICIAN for Department of Hæmatology.
8 HOUSE SURGEONS.
2 HOUSE SURGEONS for E.N.T. Department.
2 HOUSE SURGEONS for Neurosurgical Department.
3 HOUSE SURGEONS for Orthopædic Department.
HOUSE SURGEON for the Royal Eye Hospital.
Appointments are for 6 months from 15th and 22nd January, 1958.
Application form obtainable from the Secretary, Manchester Royal Infirmary, to be returned as soon as possible.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL. (Non-sectarian—104 Beds.) Applications are invited for the resident post of SENIOR HOUSE OFFICER in Surgery, to act as Deputy Resident Surgical Officer. Recognised for F.R.C.S. Vacant 11th January, 1958.
Applications, with names of 2 referees, by 9th December, 1957, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General hospital—433 Beds.) Following posts vacant on 15th January, 1958 :—
2 HOUSE OFFICERS (general surgery). Recognised for F.R.C.S. examination.
2 HOUSE OFFICERS (general medicine).
All pre-registration posts.
Application forms from Group Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General hospital—433 Beds.) SENIOR HOUSE OFFICER required for Group Laboratory. Post vacant early December, and tenable for 1 year. Duties which alternate with holder of second similar post include routine general pathology and emergency investigations. Laboratory recognised for D.Path. and D.C.P. examinations. Previous experience not essential.
Application forms from Group Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General hospital—433 Beds.) HOUSE OFFICERS (obstetrics) required. Pre-registration posts, vacant mid-January. Recognised for M.R.C.O.G. examination.
Application forms from Group Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General hospital—433 Beds.) SENIOR HOUSE OFFICER (anæsthetics) required. Post vacant early December. Hospital recognised for training for Diploma in Anæsthetics.
Application forms from Group Secretary.

MANCHESTER, 20. GROUP PATHOLOGY LABORATORY, WITHINGTON HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer grade). Vacant now. Tenable for 12 months. Previous experience in all branches of clinical pathology. Laboratory recognised for the Dip. Path.
Applications, stating age, qualifications, present post, experience and the names of 2 referees, to be forwarded to the Group Secretary immediately.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) including casualty duties. Vacant immediately. The post is recognised by the Royal College of Surgeons for the final F.R.C.S. examination, and possession of the primary F.R.C.S. will be an advantage. The Hospital is recognised by the University of Manchester for the teaching of undergraduate students.
Applications, with full details, to the Group Secretary immediately.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Plastic Surgery. Vacant 1st February, 1958. This is the only House Officer post for a Plastic Surgery Unit of 71 Beds where the candidate appointed will spend most of his time, but in addition there are some general surgical duties.
Applications, with the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20.

NANTWICH. BARONY HOSPITAL. Junior Hospital MEDICAL OFFICER (resident), temporary or permanent, required for duties in Department of Psychiatry (93 Beds), which is a very active unit, including outpatient clinics and outpatient treatment centre. Personal supervision and teaching by Consultant Psychiatrist. Good experience available in all methods of treatment. Quarters for a single person are available at the Hospital.
Applications, stating age, qualifications, &c., with names of 2 referees, to be sent to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire, within 10 days after publication.

NANTWICH. BARONY HOSPITAL. (300 Beds.) Pre-registration HOUSE OFFICER (obstetrics) required. Salary and conditions in accordance with Whitley Council scale.
Applications, stating age, qualifications, &c., with names of 2 referees, to be sent to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, within 10 days after publication.

NEWCASTLE UPON TYNE HOSPITAL MANAGE-MENT COMMITTEE. DEPARTMENT OF NEUROLOGICAL SURGERY REGIONAL UNIT. The post of SENIOR HOUSE OFFICER, either resident or non-resident, is now vacant.
Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE UPON TYNE HOSPITAL MANAGE-MENT COMMITTEE AND HEXHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Departments of Obstetrics and Gynæcology. Applications are invited for the following posts, vacant on 7th January, 1958.
(1) **Newcastle General Hospital** (838 Beds)
Department of Obstetrics and Gynæcology (100 Beds).
HOUSE SURGEONS, resident (pre-registration) (2). This department is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G., and undertakes the training of medical students in the University of Durham. Preference will be given to provisionally registered candidates who have carried out their first house appointment.
(2) **Hexham General Hospital** (304 Beds)
Gynæcology. HOUSE SURGEON, resident (pre-registration). Recognised for M.R.C.O.G. Applications considered from final year students in anticipation of graduation.
(3) **Dilston Hall Maternity Hospital, Corbridge** (50 Beds)
Obstetrics. HOUSE SURGEON, resident (pre-registration). Recognised for D.Obst.R.C.O.G.
Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, by 7th December, 1957.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) The following resident posts become vacant on the 7th January, 1958 :—
* HOUSE PHYSICIANS (4), General Medical Wards. (2 of these posts rotate with the House Physician post in the Cardiovascular Department.)
* HOUSE PHYSICIAN (1), Cardiovascular Department. (This post rotates with the 2 House Physician posts in general medicine.)
* HOUSE PHYSICIANS (4), Pædiatrics. (Hospital for Sick Children, Newcastle upon Tyne (2) and Children's Department, Newcastle General Hospital (2).) (3 of the posts are for pre-registration candidates (medical and surgical).) The posts offer experience in the whole of the pædiatric work of the hospitals, including general medicine and surgery and the special departments. There is a close association with the University Department of Child Health.
* HOUSE PHYSICIAN (1), Geriatric Unit.
* HOUSE SURGEONS (2), General Surgery (recognised for F.R.C.S. Diploma).
* HOUSE SURGEON (1), Accident and Admission Department (recognised for F.R.C.S. Diploma).
* These posts are recognised for the purpose of pre-registration service and applications will be accepted from students on the point of taking their qualifying examination.
Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4, by 7th December, 1957.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the post of REGISTRAR in the Department of Obstetrics and Gynæcology. The successful candidate will have duties in the Royal Victoria Infirmary (resident or non-resident) and the Princess Mary Maternity Hospital (resident). The appointment is recognised for examination purposes by the Royal College of Obstetricians and Gynæcologists. The appointment is for 1 year in the first instance and will be subject to the terms and conditions of service of hospital medical staff in the National Health Service.
Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.
A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar OBSTETRICIAN AND GYNÆCOLOGIST, whole-time, for Durham Group of hospitals—main hospital Dryburn (303 Beds). Appointment to commence 1st February, 1958. Single accommodation available.
Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NOTTINGHAM GENERAL HOSPITAL. 2 Senior House OFFICERS (orthopædic and fracture) required (January and February, 1958). Post offers exceptional experience in traumatic surgery.
Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. GENERAL HOSPITAL. Senior House OFFICER (medical) required on 25th January, 1958.
Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident pre-registration HOUSE PHYSICIANS required. 2 31st December, 1957; 1 21st January, 1958.
Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Resident pre-registration HOUSE SURGEONS required, 1st January, 31st January, 4th February, 5th February.
Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. MAPPERLEY HOSPITAL. (1087 Beds. Recognised for D.P.M.) Whole-time REGISTRAR (psychiatry) required. Hospital quarters available. Facilities for postgraduate study in conjunction with Sheffield University available. Appointment for 1 year in first instance.
Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 9th December, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer). Previous experience an advantage. Post vacant 16th January, 1958.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Department of Thoracic Surgery. Post vacant December 24th. Salary £819 10s. p.a. less £150 for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 testimonials, should be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE OFFICER (obstetrics and gynæcology, recognised for pre-registration purposes), which will be graded Senior House Officer or House Officer in accordance with experience. Recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. Post vacant 16th January, 1958.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY AND NOTTINGHAM CHILDREN'S HOSPITALS. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT OR NON-RESIDENT REGISTRAR (orthopædics) required from 1st January. Duties at Nottingham City Hospital (54 orthopædic beds) and Nottingham Children's Hospital (23 orthopædic beds). Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 9th December, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM CHILDREN'S HOSPITAL. (138 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Duties include work in the Casualty Department. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 9th December, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. SENIOR HOUSE OFFICER (surgical) required at the above Hospital. Good opportunity for obtaining experience in all types of general surgery. Vacancy with effect, 1st December, 1957.

Applications, stating age, qualifications, experience and nationality, together with copies of testimonials, to be sent to Hospital Secretary.

NORTHAMPTON GENERAL HOSPITAL. (500 Beds.) Vacancy 1st February, 1958, for SENIOR HOUSE OFFICER, E.N.T. Department. Recognised for F.R.C.S. and for D.L.O. Appointment to 30th September, 1958, in first instance.

Applications as soon as possible to S. G. HILL, Superintendent.

NORTHAMPTON. ST. CRISPIN HOSPITAL, Duston, NORTHAMPTON. (1120 Beds.) SENIOR HOUSE OFFICER required. Salary according to national scale (£745 p.a.). Accommodation is available at the Hospital. The Hospital is approved for training for the D.P.M. of the Conjoint Board and the post offers excellent opportunities for participation in inpatient and outpatient work, E.E.G. investigations, and child psychiatry. There is a modern Admission Unit and an annual admission-rate of over 850 patients. Regular case conferences are held.

Applications, giving full details and names of 3 referees, to be sent to the Physician-Superintendent at the Hospital within 14 days.

NEWARK HOSPITAL, London-road, Newark, Nottinghamshire. (General.) Resident Locum JUNIOR HOSPITAL MEDICAL OFFICER (medical) required for period 2nd December, 1957–4th January, 1958, inclusive. Salary £19 5s. per week less residential emoluments.

Applications, stating qualifications, with copies of 2 recent testimonials, to the Group Secretary, General Hospital, Nottingham, as soon as possible.

ORPINGTON HOSPITAL, Orpington, Kent. Resident SENIOR HOUSE PHYSICIAN required for 60-bedded Tuberculosis Unit. (30 Male and 30 Female.) Good experience in diagnosis and treatment of acute and chronic pulmonary tuberculosis. Excellent opportunity for higher qualification study with access to clinical material in general medical and surgical wards. Ex-patient Medical Officer favourably considered.

Apply Surgeon-Superintendent.

OXFORD REGIONAL HOSPITAL BOARD. NATIONAL SPINAL INJURIES CENTRE. STOKE MANDEVILLE HOSPITAL, AYLESBURY. Applications are invited for the post of REGISTRAR at this Centre, vacant on 16th January, 1958. Experience in general surgery and medicine necessary. The post offers good experience in neurology, urology, physical medicine and rehabilitation. Full details of duties, &c., can be obtained from the Administrative Officer, Stoke Mandeville Hospital.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 12th December.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Orthopædic and Accident Surgery to the Reading Group of hospitals. Recognised for the F.R.C.S. The appointment will be for 1 year and eligible for extension to 2 years. Vacant 24th January.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, to reach him by 10th December.

OXFORD. UNITED OXFORD HOSPITALS. THE RADCLIFFE INFIRMARY. Applications are invited for the post of REGISTRAR/RESEARCH ASSISTANT to the Accident Service from 1st December, 1957. The duties of this post will be divided equally between the clinical duties of the Registrar appointment, and research work in the Department, under the supervision of the Director of the Accident Service.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be returned as soon as possible.

OXFORD. UNITED OXFORD HOSPITALS. Senior REGISTRAR in Chest Diseases to the hospitals and clinics of the United Oxford Hospitals. Appointment for 1 year in the first instance. Previous experience in chest diseases and higher qualification in general medicine desirable.

Applications, on forms obtainable from the Joint Secretary to the Committee, 43, Banbury-road, Oxford, should reach him by 14th December.

NUNEATON. GEORGE ELIOT HOSPITAL. House OFFICER in Pædiatrics. Recognised pre-registration and D.C.H.

Applications to Hospital Secretary.

PERTH ROYAL INFIRMARY. The post of Senior House OFFICER (anæsthetics) will fall vacant on 1st January, 1958. The post is recognised under the regulations for the D.A. and F.F.A. R.C.S.

Applications, giving age, qualifications, experience and the names of 2 referees, should be sent to the Group Medical Superintendent, Perth Royal Infirmary, Perth.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL. Vacancies exist in the following departments:—

HOUSE SURGEON (pre-registration post), vacant 1st December. Recognised for the F.R.C.S. Devonport Hospital.

HOUSE SURGEONS (pre-registration posts), vacancies 9th December, 1957, 1st and 4th January, 1958. Recognised for the F.R.C.S. Greenbank Road Hospital.

In both cases send names of 3 referees to the Group Secretary, 7, Nelson-gardens, Devonport.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL. FREEDOM FIELDS HOSPITAL. Central Casualty Department.

SENIOR HOUSE OFFICER in Casualty, vacant 1st January, 1958. Recognised for the F.R.C.S.

Applications, stating names of 3 referees, to be sent to the Group Secretary.

PONTEFRACT GENERAL INFIRMARY. House Surgeon required. This is an approved pre-registration post under Medical Act 1950, but applications will be considered from fully registered practitioners. Hospital approved under F.R.C.S. regulations and provides excellent surgical experience. Married accommodation available. Post vacant end of November, 1957.

Applications as soon as possible to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorkshire.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

(1) **Saint Mary's Hospital**

Applications are invited for the appointment of SENIOR HOUSE OFFICER (medical), vacant 9th December, 1957. Duties will be mainly in the acute medical wards and outpatients, but there will be some duties in the Geriatric Assessment Unit of 76 Beds. The appointment affords an opportunity of seeking large numbers of acute cases and is an excellent one for those studying for a higher medical qualification.

(2) **Royal Portsmouth Hospital**

(*a*) **Orthopædic Department** (104 beds)

(i) SENIOR HOUSE OFFICER required. Vacant 1st December, 1957.

(ii) HOUSE OFFICER (pre-registration). Vacant now.

(*b*) SENIOR HOUSE SURGEON (70 surgical beds). Vacant now.

(3) **Queen Alexandra Hospital**

(*a*) SENIOR HOUSE SURGEON (87 surgical beds). Vacant 1st January, 1958.

(*b*) HOUSE PHYSICIAN (pre-registration) (78 medical beds). Vacant 1st January, 1958.

Applications, stating age, experience and qualifications, together with the names of two referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (medicine) (resident), pre- or post-registration post, required at Birch Hill Hospital. Post vacant 1st January, 1958.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) in the Department of Pathology of the Rochdale Group of hospitals. The duties will consist mainly of clinical pathology, also general and emergency work and supervision of the blood banks. Previous pathology experience is not essential. Post vacant end of year.

Applications, giving usual particulars and names and addresses of 2 referees, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancashire, at once.

ROCHESTER, KENT. ST. BARTHOLOMEW'S HOSPITAL. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade) (1 of 2 in the department) which offers excellent experience with fractures and emergency surgery, and presents facilities for studying. Recognised for F.R.C.S. Post vacant now and tenable for 1 year. Salary £819 10s. p.a.

Applications, stating age, nationality, qualifications and experience, with recent testimonials, to be sent to the Hospital Secretary.

ROCHESTER. ST. BARTHOLOMEW'S HOSPITAL. (Recognised for the F.R.C.S.) MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEONS (2). Applications are invited for 2 pre-registration posts, general surgery, 1 vacant from middle of December and 1 from the middle of January. If held by a registered practitioner, posts will be limited to 6 months. Salary £467 10s.–£577 10s. p.a. according to experience.

Applications, stating age, qualifications, nationality and experience, to be addressed to the Hospital Secretary.

RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE.

St. James' Hospital, Tredegar, Monmouthshire. (38 general medicine, 43 chronic sick and 43 obstetric beds.) Married quarters.

HOUSE PHYSICIAN (from 27th January).

OBSTETRIC HOUSE OFFICER (9th February).

Tredegar General Hospital. Surgical Unit of 50 Beds plus 6 orthopædic beds under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient, Casualty, and Radiology Departments. Married quarters.

HOUSE SURGEON (26th January) with opportunity to follow on with a House Physician or House Officer (obstetrics) if satisfactory.

Caerphilly District Miners Hospital, Caerphilly, Glamorganshire. (Acute general hospital—228 Beds), 6 miles from City of Cardiff; married quarters may be available; vacancies on 1st February :—

HOUSE SURGEON (post recognised for F.R.C.S.).

HOUSE PHYSICIAN.

HOUSE OFFICER (obstetrics and gynæcology).

Applications to the Group Secretary, Central Offices, Caerphilly-road, Ystrad Mynach, Hengoed, Glam.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. RESIDENT PATHOLOGIST (Senior House Officer grade). This post, which will become vacant in the New Year, provides valuable experience by rotation through all departments of this large Group Laboratory and is recognised for the purposes of the Diploma in Pathology. Prospective candidates are invited to visit the Laboratory.

Applications should be sent, with testimonials or the names of 2 referees, as soon as possible to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.). RESIDENT HOUSE OFFICER (general surgery) required from 7th January, 1958. Post is recognised for Pre-registration purposes and for F.R.C.S.

Applications should be forwarded immediately to Medical Superintendent stating also names of 2 referees.

RYDE. ROYAL I.W. COUNTY HOSPITAL. Isle of Wight GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CASUALTY AND ORTHOPÆDIC OFFICER required end January, 1958, at the above Hospital, either as Registrar (£935–£1061 10s.) or as Junior Hospital Medical Officer (£852 10s.–£55–£1182 10s.). The appointment is resident, married or single accommodation being available.

Forms of application may be obtained from the Group Secretary, Hospital Management Committee, Clatterford House, Carisbrooke, I.W., and should be returned not later than 21st December.

RYDE, I.W. ROYAL ISLE OF WIGHT COUNTY HOSPITAL. (116 Beds.) HOUSE SURGEON (pre-registration post and recognised for F.R.C.S.), vacant late January.

Applications, with names of 2 referees, to Hospital Secretary not later than 14th December, 1957.

SALFORD, 6. HOPE HOSPITAL. Salford Hospital MANAGEMENT COMMITTEE. Locum PÆDIATRIC HOUSE OFFICER required, for a period of approximately 2 months, from 16th December, 1957. Post recognised for the D.C.H. The department comprises 120 Beds, including medical and surgical wards, infant wards and Outpatient Department. The pædiatric staff supervise the neonatal nurseries of the Obstetrical Department (approximately 70 lying-in beds).

The following pre-registration posts become vacant on 27th January, 1958 :—

3 HOUSE PHYSICIANS.

3 HOUSE SURGEONS.

2 OBSTETRICAL HOUSE OFFICERS.

Applications, giving age, qualifications and names and addresses of 2 referees, to the Hospital Secretary as soon as possible.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance:—

SENIOR REGISTRAR in Pathology based at Stobhill General Hospital, Glasgow, with duties at the Western District Hospital, Glasgow.

SENIOR REGISTRAR in Medicine based at Hairmyres Hospital, East Kilbride.

SENIOR REGISTRAR in Ophthalmology based at the Glasgow Eye Infirmary.

REGISTRAR in Medicine based at Larkfield Hospital, Greenock.

REGISTRAR in Psychiatry based at Woodilee Mental Hospital, Lenzie, near Glasgow.

REGISTRAR in Surgery based at the Western Infirmary, Glasgow, with duties on a rotational basis at the Vale of Leven Hospital, Alexandria, Dunbartonshire.

REGISTRAR in Surgery based at Stobhill General Hospital, Glasgow, with duties on a yearly rotational basis at Falkirk and District Royal Infirmary.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 14th December, 1957.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Dundee area. (Thoracic (and cardiac) surgery). Applications are invited for the appointment of SENIOR REGISTRAR or REGISTRAR in Surgery (depending upon qualifications and experience) for duty in the Regional Thoracic Surgical Centre at Ashludie Hospital, Monifieth, by Dundee (222 Beds—60 for thoracic surgery), and in the cardiovascular department of the Professorial Surgical Unit at Dundee Royal Infirmary (the principal general teaching hospital associated with the University of St. Andrews—534 Beds). Previous experience in thoracic surgery and general chest medicine an advantage. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 7th December, 1957.

SCOTTISH NATIONAL BLOOD TRANSFUSION ASSOCIATION. Applications are invited for the post of Whole-time ASSISTANT MEDICAL OFFICER at the Aberdeen Centre. The appointment offers training in blood group serology and the activities of the Centre cover the full range of blood-transfusion work. Salary £852 10s.–£1182 10s. p.a. National Health Service (Scotland) superannuation regulations.

Applications, stating age, qualifications and experience, together with the names of 2 referees, should be addressed to the Regional Director, Aberdeen and North East of Scotland Blood Transfusion Service, Royal Infirmary, Foresterhill, Aberdeen.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR to the Royal Edinburgh Hospital for Mental and Nervous Disorders. The Hospital, which is linked with the University Department of Psychological Medicine and includes the professorial unit in Jordanburn Nerve Hospital, offers exceptional opportunities for varied clinical work, teaching and research. During the tenure of the post opportunities for interchange of duty and training at other centres in the region may be available under arrangements made between the South Eastern Regional Hospital Board and the University Department of Psychological Medicine. Applicants must have good psychiatric experience and a higher qualification is desirable. Single accommodation is available.

Apply, giving particulars of age, qualifications and previous experience, and the names of 3 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 21st December, 1957.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order from 1st January, 1958, for a period of 6 months in each post. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SHEFFIELD. CITY GENERAL HOSPITAL. (658 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR required 4th February, in the Regional Cardiovascular Department at the City General Hospital, Sheffield—a large general hospital having teaching affiliations with the University of Sheffield, a Professorial Medical Unit and a Department of Thoracic Surgery. Some knowledge of practical cardiology desirable. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 9th December, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD, 5. CITY GENERAL HOSPITAL. Department OF PATHOLOGY, GROUP LABORATORY. Applications are invited for the appointment of SENIOR HOUSE OFFICER (clinical pathology). Resident accommodation is available and optional. Opportunities for training in morbid anatomy, biochemistry, haematology and bacteriology. The work of this and the associated hospitals offers excellent experience to graduates who wish to make pathology their permanent career. The post is recognised for the D.Path.

Apply, giving details of age, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, to the Group Secretary, Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. MIDDLEWOOD HOSPITAL. (2089 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRAR in Psychiatry required. D.P.M. essential. Appointment for 1 year in the first instance, reviewable annually. Opportunity for research and experience in the special branches of psychiatry available in the hospital area.

Application forms and further details obtained from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 9th December, 1957.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. SENIOR REGISTRAR in Psychiatry required to work under the Consultant Psychiatrist and Professor of Psychiatry in the newly established Psychiatric Department. D.P.M. essential. There will be opportunities for research.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 14th December, 1957, to the Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE SURGEON required, pre-registration post.

Applications, with names of 2 referees, to Secretary.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. House PHYSICIANS. Applications invited for 2 posts—1 graded Senior House Officer/Pre-registration, vacant mid-January—1 graded Pre-registration/Senior House Officer, vacant late January. Modern Hospital with busy department, including medicine, pædiatrics, skins and eyes, with busy outpatient clinics offering good experience.

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. Applications invited for post of HOUSE SURGEON Senior House Officer/Pre-registration, vacant early February. Modern Hospital with busy department including general surgery and gynæcology.

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

SHOREHAM BY SEA, SUSSEX. SOUTHLANDS HOSPITAL. (411 Beds.) WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEON posts, both recognised by R.C.S. for fellowship. 1 vacant now, duties in general surgery and orthopædics. 1 vacant 17th December, pre-registration or registered practitioner.

Applications to Secretary, Southlands Hospital.

A. V. OAKTON, Group Secretary.

SOUTHAMPTON EYE HOSPITAL. (32 Beds. Recognised for D.O. Examination.) RESIDENT SENIOR HOUSE OFFICER required end December.

Applications, with copies of testimonials, should be forwarded as soon as possible to Secretary, Southampton Group Hospital Management Committee, Bullar-street.

SOUTHAMPTON GENERAL HOSPITAL. (474 Beds.) RESIDENT HOUSE SURGEONS (2) required. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. JUNIOR ANÆSTHETIST. Junior Hospital Medical Officer or Senior House Officer grade, according to experience. Post recognised under Fellowship and Diploma Regulations.

Applications, with names of 2 referees, to Group Secretary, Preston Hospital, North Shields.

SOUTHEND GENERAL HOSPITAL. Applications are invited for the post of SECOND CASUALTY OFFICER (Senior House Officer grade), with duties in the Fracture and Orthopædic Department. Resident. Post vacant 1st January, 1958. The post is recognised for the F.R.C.S.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to reach the undersigned as soon as possible. J. C. FIELD, Secretary.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE PHYSICIAN (House Officer grade) required for 1 of the 2 medical teams. Post vacant 21st December, 1957, and tenable for 6 months. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL. (384 Beds.) North West METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR required for 1 of the 2 acute medical teams at above Hospital, from 12th February, 1958. Post suitable M.R.C.P. training. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, by 14th December, 1957.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for 1 of the 2 surgical teams from 19th December, 1957. Post recognised for F.R.C.S. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS (near), HERTFORDSHIRE. SHENLEY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Psychiatry. Possession of the D.P.M. or higher medical qualification essential. Preference will be given to an applicant of wide training in psychiatry who requires further experience before applying for consultant post. Unfurnished house available at a moderate rental for a married candidate. Hospital may be visited by appointment.

Application forms, obtainable from and returnable to Secretary, Shenley Hospital Management Committee, by 31st December, 1957.

ST. ALBANS (near). SHENLEY HOSPITAL. (2360 Beds—16 miles from London.) Applications are invited for the post of PSYCHIATRIC REGISTRAR at above Hospital. Single residential accommodation available. The Hospital may be visited by appointment.

Application forms obtainable from and returnable to Secretary, Shenley Hospital, near St. Albans, Herts, by 9th December, 1957.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE PHYSICIAN required (pre-registration). Post vacant early January.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) required. Recognised for F.R.C.S. 2 posts vacant early January.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (E.N.T.) required. Recognised F.R.C.S. and D.L.O.

Detailed applications, with copy testimonials to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (pædiatrics) required. Post vacant 14th January. Pre-registration. Hospital recognised for D.C.H.

Detailed applications, with copy testimonials, to Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following pre-registration posts :—

Stockport Infirmary (163 Beds)
HOUSE OFFICER (surgery), vacant 31st January, 1958. Recognised for the F.R.C.S. and D.L.O.

Stepping Hill Hospital (529 Beds)
HOUSE OFFICER (medicine), vacant 27th January, 1958.
HOUSE OFFICER (medicine), vacant 21st February, 1958.
HOUSE OFFICER (obstetrics), vacant 1st March, 1958. Recognised for the D.Obst. R.C.O.G.

Applications, with full particulars and copies of 2 testimonials, to the Group Secretary, 59B, Shaw Heath, Stockport.

STOCKPORT INFIRMARY, Stockport. (163 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Assistant Resident Surgical Officer) (general and orthopædics), vacant 10th January, 1958. The post is recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOKE MANDEVILLE HOSPITAL, Aylesbury, Buckinghamshire. RESIDENT HOUSE PHYSICIAN required for the Department of General Medicine. Recognised pre-registration post. Applications from registered practitioners will be considered. Post vacant 16th January, 1958.

Applications, with copies of 2 testimonials, to the Administrative Officer by 6th December, 1957.

STOKE MANDEVILLE HOSPITAL, Aylesbury, Buckinghamshire. HOUSE SURGEON for Gynæcology Department. Post recognised for M.R.C.O.G. Vacant 1st January, 1958.

Applications from registered practitioners, with 2 testimonials, to the Administrative Officer as soon as possible.

STRATFORD-ON-AVON HOSPITAL. (163 Beds.) RESIDENT HOUSE SURGEON. New post providing excellent experience.

Applications, with 2 recent testimonials, to Hospital Secretary.

SUTTON. BELMONT HOSPITAL. St. Ebba's and BELMONT GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment as SENIOR PSYCHIATRIC REGISTRAR at above Hospital, which is principally concerned with the treatment of neuroses and the early psychoses. There are ample opportunities for research and the Hospital, which is recognised for the D.P.M., takes an active part in teaching in association with teaching hospitals. The vacancy is in the Social Rehabilitation Unit which is concerned primarily with treatment on group community and family lines. Candidates may visit the Hospital by appointment with the Physician-Superintendent.

Application forms may be obtained from the Group Secretary, Group Officer, Belmont Hospital, Brighton-road, Sutton, Surrey, and completed forms (5 copies) should be returned to him within 2 weeks of the appearance of this advertisement.

SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Pædiatric Unit of the above Hospital. The post is recognised for the D.C.H.

Applications, with full particulars and copies of 2 recent testimonials, should be sent to the Medical Superintendent of the Hospital. T. E. JONES, Group Secretary.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SWINDON HOSPITALS. Applications invited for post of RESIDENT HOUSE PHYSICIAN in acute medical unit of 64 Beds at St. Margaret's Hospital. Recognised for training under pre-registration internship regulations and vacant on 17th December, 1957.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, immediately.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. (423 Beds.) SENIOR HOUSE OFFICER (general medicine) required. This post offers excellent opportunities for those preparing to take M.R.C.P.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for HOUSE OFFICER (E.N.T.) post vacant 15th December, 1957. Post-registration appointment, recognised for F.R.C.S. and D.L.O.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TUNBRIDGE WELLS (near). PEMBURY HOSPITAL, PEMBURY. Applications invited for appointment of SENIOR ORTHOPÆDIC HOUSE SURGEON AND CASUALTY OFFICER (Senior House Officer grade) to begin duties as soon as possible. Recognised F.R.C.S. (Eng.) and tenable for 1 year. Work includes treatment of long and short stay cases and traumatic surgery with large Outpatient and Fracture Clinics under 2 Consultants.

Apply, stating age, qualifications and experience, together with 3 testimonials, to Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells.

TORQUAY. TORBAY HOSPITAL. (166 general beds.) RESIDENT HOUSE OFFICER (surgical), Male or Female, required approximately 15th December, 1957. Post recognised for F.R.C.S. and pre-registration purposes. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, nationality and age, together with copy testimonials (quoting reference F.955/84), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TORQUAY. TORBAY HOSPITAL. (166 acute general beds.) HOUSE OFFICER (medicine), Male or Female, required early January 1958. Pre-registration appointment. General duties which will include some work in the E.N.T., the Ophthalmic and Radiotherapy Departments.

Applications, stating qualifications, nationality, age, together with copy testimonials (quoting ref. F.955/85) to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TORQUAY. TORBAY HOSPITAL. Resident Casualty OFFICER (Senior House Officer status) required approximately 23rd December, 1957. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, nationality, age (quoting ref. F.955/86), with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TREDEGAR GENERAL HOSPITAL, MONMOUTHSHIRE. RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SURGICAL OFFICER (Senior House Officer or Junior House Medical Officer grade according to experience) required for Surgical Unit at above Hospital. Duties are those of Assistant to General Surgeon; staff, includes House Surgeon. Commodious family flat.

Apply, with full particulars and stating names of 2 referees, to Secretary.

WALLINGFORD (near), BERKSHIRE. FAIR MILE HOSPITAL. BERKSHIRE MENTAL HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at above mental Hospital of 1053 Beds. The post provides an excellent opportunity for postgraduate training in psychiatry, including outpatient clinic work and every facility is provided for study for the D.P.M. Residential accommodation for a married man will shortly become available. The appointment is subject to the terms and conditions of service for hospital medical staff. The salary is £852 10s.–£55–£1182 10s.

Applications, including details of age, qualifications and experience, together with names of 2 referees, should be forwarded to the Medical Superintendent, Fair Mile Hospital, near Wallingford, Berks, within 10 days of the appearance of this advertisement.

WARRINGTON INFIRMARY. Applications are invited from Males and Females for the post of RESIDENT CASUALTY OFFICER (graded as Junior Hospital Medical Officer) at the above Hospital. The post is now vacant and is recognised for the F.R.C.S. Scale of salary £852 10s.–£55–£1182 10s., less a deduction of £170 for the residential emoluments. A whole-time Senior Hospital Medical Officer is in charge of the Department.

Applications, stating age, experience and qualifications, should be forwarded to—

HENRY L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARWICK HOSPITAL. (320 Beds.) Paediatric House PHYSICIAN, resident, required in January. 30-bedded paediatric unit. Post recognised D.C.H. and pre-registration.

Applications, with 2 recent testimonials, to Medical Superintendent.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the following appointments. Pre-registration.

West Bromwich and District General Hospital (144 Beds)
1 HOUSE PHYSICIAN.
1 HOUSE SURGEON.

Hallam Hospital (430 Beds)
2 HOUSE PHYSICIANS.
2 HOUSE SURGEONS.
2 HOUSE OFFICERS (obstetrics and gynæcology).

These posts will be vacant 8th January, 1958.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEST DORSET GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PATHOLOGICAL REGISTRAR (preferably resident) required. General laboratory and emergency duties, with training in all branches. Some laboratory experience essential. Salary on Registrar grade, less £170 p.a., if resident. The laboratory, recognised for D.Path., is modern and well equipped, and a Public Health Laboratory Service unit is housed in the same building, so that a wide experience is available. Candidates may visit by appointment.

Application forms, returnable by 14th December, 1957, from Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

WEST MALLING, KENT. LEYBOURNE GRANGE COLONY FOR MENTAL DEFECTIVES. (1511 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required at above Colony. Salary scale £852 10s.–£55–£1182 10s. a year. Appointment is subject to the terms and conditions of service for hospital medical and dental staff and is limited to a period of 3 years in the first instance. Usual residential accommodation for single officer, furnished or unfurnished accommodation available for married officer. Ample facilities for study.

Applications, with full details as to age, nationality, qualifications, present post and previous experience, together with names and addresses of 2 referees, to the Group Secretary as soon as possible.

WELSH REGIONAL HOSPITAL BOARD. Sully Hospital, SULLY, near PENARTH, GLAMORGANSHIRE. (324 Beds.) REGISTRAR in Thoracic Medicine. Regional centre for pulmonary tuberculosis and all other chest and heart conditions. Resident or non-resident. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR in General Medicine, East Glamorgan and Llwynypia Hospitals, Pontypridd and Rhondda Hospital Management Committee area. Resident/non-resident.

REGISTRAR (obstetrics), based at St. David's Hospital (Maternity Unit—108 Beds), to serve Cardiff Hospital Management Committee. Resident. Regular undergraduate teaching takes place. Recognised for M.R.C.O.G.

REGISTRAR (E.N.T. surgery), Mid Glamorgan Hospital Management Committee, based Neath General Hospital with visits to other hospitals in Group. Resident/non-resident.

REGISTRAR (general surgery), based Merthyr General Hospital, Merthyr (120 Beds), also required serve other hospitals in group. Hospital recognised for F.R.C.S. Resident/non-resident.

REGISTRAR (psychiatry), St. David's Hospital, Carmarthen (1000 Beds). All modern forms of treatment carried out. Extensive outpatient service undertaken. Hospital recognised for training for D.P.M. Flat available.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (general medicine), Merthyr and Aberdare Hospital Management Committee area. Based Merthyr General Hospital (120 Beds). Non-resident.

REGISTRAR (pædiatrics), based Merthyr General Hospital, Merthyr, to serve Merthyr and Aberdare Hospital Management Committee.

SURGICAL REGISTRAR (plastic surgery), St. Lawrence Hospital, Chepstow (177 Beds). Expected to visit other hospitals in South Wales area. Considerable opportunities for training in specialty. Accommodation for single person.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL HOSPITAL BOARD. Registrar (psychiatry), Morgannwg Hospital, Bridgend (all modern treatments, active outpatient clinics). Child Guidance Clinic and Psychological Department. Within easy reach of University of Wales. Accommodation available. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WIGAN (near). WRIGHTINGTON HOSPITAL. Senior HOUSE OFFICER required. 247 Beds for orthopædic, mainly tuberculosis, and 94 Beds for chest cases. Salary and board charge in accordance with national scale.

Applications to Secretary with 2 names for reference.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area Orthopædic team. Appointment for 6 months in first instance. Vacant immediately.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant immediately.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Resident MEDICAL REGISTRAR required early February.

Application forms from and returnable to Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 7th December.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) SENIOR HOUSE OFFICERS (anæsthetics). Posts vacant 20th and 28th January. Recognised for D.A. and F.F.A. R.C.S.

Apply, giving age and qualifications with copies of 2 testimonials, to the Hospital Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) Vacancies for Pre-registration HOUSE OFFICERS (medicine) occur on 2nd, 17th and 22nd January.

Please apply, with copies of 2 testimonials, to Hospital Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICER (pædiatrics) required. Vacant 20th January, 1958.

Apply, giving age and qualifications, with copies of 2 testimonials, to the Hospital Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICERS. Vacancies in Surgery occur on 1st, 6th, 11th, and 23rd January, 1958.

Apply, giving age and qualifications, with copies of 2 testimonials, to the Hospital Secretary.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. (Acute General—210 Beds.) WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. The following vacancies will occur shortly :—

HOUSE SURGEON, early December.
HOUSE SURGEON, January, 1958.
HOUSE PHYSICIAN, early January, 1958.

Applications from either registered medical practitioners or pre-registration candidates, stating age, qualifications, experience, nationality, and enclosing copies of 2 recent testimonials, to be forwarded to the Hospital Secretary immediately.

A. V. OAKTON, Group Secretary.

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN, CANADA. Vacancies exist for appointments as RESIDENT and ASSISTANT RESIDENT in services of radiology, pædiatrics and obstetric/gynæcologist in 800-Bed General Hospital. All services very active. Stipend $200 per month for Assistant Resident : $250 for Residents. Full maintenance provided.

Apply : Superintendent.

CANADA. KINGSTON GENERAL HOSPITAL, Kingston, ONTARIO. Canadian Teaching Hospital of Queen's University offers approved rotating INTERNESHIPS for 12 months commencing 1st July, 1958. Vigorous interne training programme. Opportunities for further appointments to more senior clinical posts and to research fellowships. Honorarium $100 per month plus full residential emoluments.

Apply Superintendent.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1 or 2-year approved GENERAL PRACTICE RESIDENCY in modern 234-Bed General Hospital 10 miles from Detroit. Excellent facilities. Hospital approved for exchange-visitor programme. Beginning monthly salary $250 if single, $300 if married. Free housing.

Apply: Director.

NEW ZEALAND. QUEEN ELIZABETH HOSPITAL, ROTORUA, NEW ZEALAND. There are 2 vacancies for MEDICAL OFFICERS at the Queen Elizabeth Hospital, Rotorua, New Zealand, a national institution engaged in research into, and the treatment of, rheumatoid arthritis and other rheumatic diseases. Commencing salary will be between £900 and £1060 according to qualifications and experience rising to £1170, together with full board and lodging.

Additional information, application forms, &c., may be obtained on request from the High Commissioner for New Zealand, 415, Strand, London, W.C.2, with whom completed applications should be lodged not later than 21st December, 1957.

U.S.A. SACRED HEART HOSPITAL, Norristown, PENNSYLVANIA, U.S.A. (175 Beds.) Applications invited for 1-year ROTATING INTERNS (1st July, 1958). Fully accredited Hospital with active service. Salary $3000 p.a. with room and board. Apartment included if married. GENERAL PRACTICE RESIDENTS, 1-year appointments flexible accredited programme. Visitor Exchange Programme registered Hospital.

Request applications from Chairman, House Staff Committee, Sacred Heart Hospital, Norristown, Pa.,. U.S.A.

Public Appointments

LONDON COUNTY COUNCIL. Applications invited from medical practitioners practising in locality under National Health Service for appointment as VISITING MEDICAL OFFICER to Liskeard Lodge Assessment and Reception Centre, 27, Liskeard-gardens, S.E.3, accommodating 20 children (2–15 years). Remuneration £40 a year plus fees receivable from Executive Council in respect of residents and residential staff who may be taken on National Health Service list.

Particulars and application forms returnable by 20th December from Medical Officer of Health (PH/D.1/2137), County Hall, S.E.1.

BIRMINGHAM. CITY OF BIRMINGHAM EDUCATION COMMITTEE. Applications are invited from registered medical practitioners (Men or Women) for appointment as SCHOOL MEDICAL OFFICER in the School Health Service. The possession of a D.P.H. or D.C.H. will be an advantage. Salary in accordance with Whitley Council scale of £1050–£50–£1200–£55–£1475 p.a. Appointment is subject to the appropriate superannuation act and to the passing of a medical examination.

Forms of application obtainable from the undersigned (stamped addressed envelope) must be returned by 17th December, 1957. Canvassing disqualifies.

E. L. RUSSELL, Chief Education Officer.

School Health Service, 102, Edmund-street, Birmingham, 3.

LEICESTER. CITY OF LEICESTER. Applications are invited for the post of SENIOR MEDICAL OFFICER for Maternity and Child Welfare from registered medical practitioners with special experience in maternity and child welfare work ; senior qualifications will be an asset. Whitley Medical Council Committee "*C*" conditions of service and salary scale, i.e., £1520–£1955 p.a. The appointment may be terminated by 3 months' notice. It is subject to the provisions of the Local Government Superannuation Acts, 1937 to 1953, the successful candidate being required to pass a medical examination. The officer appointed will be under the control of the Medical Officer of Health, and will be required to carry out such duties as may be assigned to him/her.

Applications, giving the names of 3 referees, should be sent to the undersigned, from whom application forms and further particulars may be obtained, on or before 14th December, 1957.

E. K. MACDONALD, Medical Officer of Health.

City Health Department, 1A, Grey Friars, Leicester.

NORTHUMBERLAND COUNTY COUNCIL. Applica-tions are invited from registered medical practitioners for the appointment of ASSISTANT COUNTY MEDICAL OFFICER to undertake duties primarily connected with maternal and child welfare. Salary scale £1050–£50–£1200–£55–£1475. Previous experience may be taken into consideration in determining the commencing salary. Travelling and subsistence allowances when applicable will be paid in accordance with the Council's scale. The appointment is subject to superannuation and will be determinable by 3 months' notice on either side. The successful candidate will be required to pass a medical examination. Applicants must hold a driving licence. Mileage allowance will be paid, or a car provided.

Forms of application and any further particulars required may be obtained from the County Medical Officer, County Hall, Newcastle upon Tyne, 1, and must be returned not later than 6th December, 1957.

COVENTRY CORPORATION require 2 School Medical OFFICERS and ASSISTANT MEDICAL OFFICERS OF HEALTH (joint posts) for duties connected with medical inspection and clinic treatment of school-children, maternity and child welfare work and such other duties as the Medical Officer of Health and Principal School Medical Officer may include from time to time. Qualifications/experience in ascertainment of handicapped pupils an advantage. Salary £1050–£1475. Commencing salary according to experience/qualifications.

Application forms, &c., from Medical Officer of Health, New Council Offices, Coventry, returnable without delay.

DERBYSHIRE COUNTY COUNCIL. Appointment of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH for the Derbyshire County Council and MEDICAL OFFICER OF HEALTH for Buxton Borough, Whaley Bridge Urban District and Chapel-en-le-Frith Rural District. Applications are invited from Male or Female registered medical practitioners holding a Diploma in Public Health or an equivalent qualification for the above mentioned permanent "mixed" appointment. The total inclusive annual salary will be £1785 0s. 1d.–£57 14s. 6d. (3)–£60 (1)–£25 (4)–£2118 3s. 7d. p.a. The person appointed will be directly responsible to each District Council for the proper performance of all the duties of a Medical Officer of Health for the respective areas. As Assistant County Medical Officer he will be concerned, under the direction of the County Medical Officer of Health, with decentralised supervision required under the National Health Service, as well as work in connection with the School Health Service, attendance at clinics, and such other duties as may be required. The Officer will be required to live in the area of the District Councils. Sympathetic consideration will be given to the provision of temporary housing accommodation, if required. The Officer must not engage in private practice, and must devote whole time service to the duties of the before-mentioned posts. The appointment is subject to the provisions of the Local Government Superannuation Acts, 1937–53, and the successful candidate will be required to pass a medical examination. Canvassing, either directly or indirectly, will be a disqualification.

Application forms may be obtained from the County Medical Officer, County Offices, St. Mary's Gate, Derby. Completed forms should be sent to the Town Clerk, Town Hall, Buxton, so that they are received not later than 21st December, 1957.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
WIGSTON	LEICESTER	14TH DECEMBER, 1957
ASTON	WARWICK	14TH DECEMBER, 1957
ERDINGTON	WARWICK	14TH DECEMBER, 1957
BIRTLEY	DURHAM	14TH DECEMBER, 1957

LUTON. BOROUGH OF LUTON. Assistant Medical OFFICER. Applications are invited for this appointment. Salary scale: £1050–£50–£1200–£55–£1475. Commencing salary within the scale will be commensurate with qualifications and experience. Car allowance payable. Preference will be given to applicants possessing a Diploma in Public Health. Duties will include work in connection with school health services, hospital treatment of infectious diseases, and part III personal health services.

Full particulars and conditions of appointment obtainable from the Medical Officer of Health, Public Health Department, 63/69, Guildford-street, Luton, to whom applications should be delivered by 16th December, 1957.

Town Hall, Luton. A. D. HARVEY, Town Clerk.

MINISTRY OF SUPPLY. Sessional Medical Officer (unestablished) required for part-time duty at the Royal Ordnance Factory at Birtley, Co. Durham. Applications invited from registered medical practitioners of British nationality. Previous experience in industrial medicine or possession of Diploma in Industrial Health will be an asset. Time of attendance by agreement and fees payable according to agreement between B.M.A. and Treasury ; details available on application.

Write, giving date of birth, sex, education, full details of qualifications and experience of posts held (including dates) to the Ministry of Labour and National Service, 1/6, Tavistock-square, London, W.C.1, quoting PE.3180. Only candidates selected for interview will be advised.

NOTTINGHAMSHIRE COUNTY COUNCIL. MANS-FIELD BOROUGH COUNCIL. MANSFIELD HOSPITAL MANAGEMENT COMMITTEE. Mixed appointment. Applications are invited from registered medical practitioners for the mixed whole-time appointment of ASSISTANT COUNTY MEDICAL OFFICER AND DEPUTY MEDICAL OFFICER OF HEALTH of the Mansfield Borough Council and ASSISTANT MEDICAL OFFICER, Forest Hospital, Mansfield (Mansfield Hospital Management Committee). Applicants must have had at least 3 years' professional experience since qualifying; be experienced in the duties of medical officer of health, school medical officer, and the care of mothers and young children, and possess a diploma in public health.

Salaries will be as follows:—

(*a*) As Assistant County Medical Officer (28/44ths) £763 12s. 9d.–£36 7s. 3d. (3)–£40 (5)–£1072 14s. 6d. p.a. (On scale £1050–£50–(3)–£55 (5)–£1475 p.a. plus loading in accordance with Spens formula.)

(*b*) As Deputy Medical Officer of Health, Mansfield Borough Council (12/44ths) £343 12s. 9d.–£15–£403 12s. 9d. p.a. (On scale £1160–£55 (4)–£1380 plus 12/44ths of £100.)

(*c*) As Assistant Medical Officer, Forest Hospital, Mansfield (4/44ths) £183 15s. p.a.

Application forms and conditions of appointment are obtainable from my office, and applications should reach me by 21st December, 1957. Canvassing disqualifies.

A. R. DAVIS, Clerk of the County Council.

Shire Hall, Nottingham.

CHESHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT COUNTY MEDICAL OFFICER on the county medical staff (Macclesfield area). The work will be concerned mainly with medical inspection of schoolchildren, and experience in the ascertainment of handicapped children will be an advantage. It will also include attendance at child welfare centres. The appointment is superannuable and subject to medical examination. Salary scale £1050–£50–£1200–£55–£1475, with car allowance and subsistence allowance, according to the county scale (previous experience will be taken into consideration).

Forms of application may be obtained from the undersigned, to whom they should be returned not later than 31st December, 1957.

ARNOLD BROWN, County Medical Officer.

County Hall, Chester.

PETERBOROUGH. CITY AND SOKE OF PETERBOROUGH. Appointment of CITY MEDICAL OFFICER OF HEALTH AND DEPUTY COUNTY MEDICAL OFFICER. Applications are invited from medical practitioners holding the qualifications required by statutory regulations for full-time service in the mixed appointment of City Medical Officer of Health (5/11ths), Deputy County Medical Officer of Health (3/11ths) and Deputy School Medical Officer under the Peterborough Joint Education Board (3/11ths). Salary £1780–£55–£2000 (M.D.C. scale). Car allowance and other Whitley Council provisions.

Forms of application and further particulars may be obtained from the Town Clerk, P.O. Box No. 8, Town Hall, Peterborough, Northants. Closing date Saturday, 14th December, 1957.

GOVERNMENT OF THE FEDERATION OF RHODESIA AND NYASALAND. MINISTRY OF HEALTH. Applications are invited from medical practitioners with a higher qualification in anæsthesiology for the newly created post of Full-time SPECIALIST ANÆSTHETIST with salary at the fixed rate of £2750 p.a. Duties will include the giving of anæsthetics to Government patients and the teaching of anæsthesiology to Government Medical Officers and Junior Resident Medical Officers. No private or consultant practice will be permitted.

Write for application forms and further details to the Secretary (R), Rhodesia House, 429, Strand, London, W.C.2. Closing date 28th December, 1957.

HER MAJESTY'S OVERSEAS CIVIL SERVICE. UGANDA. PATHOLOGIST required to work in the Medical Laboratory under the Senior Pathologist. Duties include teaching pathology, forensic medicine and hæmatology. Candidates must possess medical qualifications registrable in the United Kingdom. Appointment on permanent basis with pension (non-contributory) and salary £1284–£2115 a year; or on short term contract, with gratuity, and salary £1503–£2115 a year. Salary starting-point determined by qualifications and experience. Gratuity (taxable) for contract service is 13½% of total salary drawn, excluding allowances. Pension at rate of 1/600th of final pensionable emoluments for each completed month of service. Candidate in National Health Service may retain superannuation rights up to 6 years and receive gratuity (taxable) of 20% of salary after engagement. Only permanent officer can be a member of Her Majesty's Overseas Civil Service. Quarters at low rental. Items of hard furniture supplied at additional rental of £12–£24 a year. Free passages in both directions, for officer serving tour of 30–36 months—i.e., 4 air passages provided for officer, wife and dependent children or sea passages up to cost of 3 adult fares. European primary schools in certain centres; in other centres, subsidy of £90 p.a. (or half school fees, whichever is less), for education of first child outside East Africa, with additional subsidy of £9 for second child and £18 for third or subsequent child attending school at same time. Secondary school facilities in Kenya. For a child at boarding school in United Kingdom (or elsewhere in Commonwealth) subsidy of £140 p.a. (or 3/5ths of fees, whichever is less), with additions as above for second and subsequent children. Income-tax at local rates. Local leave permissible and generous home leave granted after each tour.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD. 117/9/018).

HER MAJESTY'S OVERSEAS CIVIL SERVICE. ASSISTANT MEDICAL SUPERINTENDENT required for Mental Hospital in Barbados for general clinical duties and to take control in absence of Medical Superintendent. Candidates must possess qualifications registrable in United Kingdom and have experience in mental diseases. D.P.M. an advantage. Appointment on permanent basis with pension (non-contributory) 1/600th of final pensionable emoluments for each completed month of pensionable service; or on agreement for 3 years in first instance. If appointed on agreement employer's share of contributions to any approved superannuation scheme paid by Government. Only permanent Officers can be members of Her Majesty's Overseas Civil Service. Salary scale £1350–£1550 p.a. Quarters at low rental. Income tax at local rates. Passages for officer and family on appointment up to maximum £400. Leave passages for officer and wife. Climate healthy, social and recreational facilities good. Educational facilities available.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD. 117/28/03).

General Practice

For an ***Executive Council post*** *(England and Wales) apply on form* E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

BURNLEY, LANCASHIRE. Applications are invited for medical vacancy due to resignation, arising February, 1958. Present list 2150 (approx.). Chiefly urban in "intermediate" area. Residence and surgery premises available for purchase.

Applications, on Form E.C.16A, to be submitted not later than 13th December, 1957, to:—

T. A. WATSON, Clerk of Burnley Executive Council.

32, Manchester-road, Burnley.

DUMFRIESSHIRE EXECUTIVE COUNCIL invite applications from registered medical practitioners for succession to a deceased practitioner's practice in mining area of Kirkconnel. Approximately 3400 persons on list. The Council consider the practice might be suitable for two practitioners acting in partnership. Further particulars obtainable from the undersigned, with whom applications by letter, stating age, qualifications, experience, and names of 3 referees, should be lodged by 14th December, 1957.

WILLIAM DODDS, Clerk.

35, Castle-street, Dumfries.

Miscellaneous

Italian-speaking Medical Officer wanted for Rhodesia. A vacancy exists for a Medical Officer to the main civil engineering contractors of the Kariba hydo-electric scheme on the Zambezi River in the Federation of Rhodesia and Nyasaland. The successful applicant must hold the necessary British medical qualifications to enable him to practise in Southern Rhodesia, and must be able to speak Italian fluently as his patients will be the Company's employees, nearly all of whom are Italian and many of whom speak no English. The appointment will be for a period of 2 years, with 25 days p.a. paid leave. Salary will be in accordance with qualifications and experience, between £1800 and £2400 p.a. A furnished house will be provided free of charge. A nominal charge will be made for electricity, while water is free; motor transport will be provided free. The Company will pay the passages of the successful applicant and his family from the United Kingdom to Kariba and back at the end of his contract. There is a fully-equipped Government Hospital with a surgeon and physician in attendance at Kariba.—Applications to The General Manager, Impresit Kariba (Pvt.) Limited, Third Floor, Shepperton House, 90, Cameron-street, Salisbury, Southern Rhodesia.

Korea. Doctor (Female) required with paediatric experience; age preferably between 26 and 40. Contract 1 year renewable. Salary £1000 p.a. Maintenance equipment allowances and fares paid. 1 month's holiday per year. Duties in Pusan, Korea.—Apply Foreign Relief Secretary, Save the Children Fund, 12, Upper Belgrave-street, S.W.1. Telephone SLOane 9171.

Medical Adviser required by leading pharmaceutical manufacturers in London. Applicants should hold a British medical qualification and be of British nationality. An excellent knowledge of French is absolutely essential and previous experience is desirable. The post is full-time, permanent and pensionable, with a commencing salary of £2400 p.a.—Reply to Address, No. 352, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Principal Medical Officer required by The Assam Railways and Trading Co. Ltd., situated in North East Assam, India, and employing some 6000 persons. The practice also includes the employees of 5 tea gardens. Training in tropical medicine and a fair knowledge of surgery are essential, and experience of hospital administration is desirable. Gross salary, including allowances, is in the range of £3250–£4000 p.a. with free furnished quarters, &c.—Write, giving full particulars, to The Acting Secretary, The Assam Railways and Trading Co. Ltd., Cereal House, 58, Mark-lane, E.C.3.

Australia. Queensland. The Associated Friendly Societies' Medical Institute at Bundaberg, requires services of a Medical Officer. Salary £A1000 p.a., plus free residence. Private practice is allowed, which is estimated to be worth an additional £A1500. —Full particulars obtainable from Agent-General for Queensland, 409, Strand, London.

Biochemist. A junior biochemist is wanted to work on human plasma proteins in the Blood Products Laboratory, Lister Institute, Elstree.—Apply in writing, stating age, qualifications and any previous experience, to the Secretary, The Lister Institute of Preventive Medicine, Elstree, Herts.

Doctors requiring applications, theses copied: Write to MANTON (WESTMINSTER) LTD., 98, Victoria-street, S.W.1 (VIC 0141), who are specialists.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £2 2s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

The Disease of Tobacco Smoking and its Cure, by Dr. Lennox Johnston. 3s. 6d. from all booksellers.—CHRISTOPHER JOHNSON PUBLISHERS LIMITED.

Typewriting and Duplicating. First-class work at moder-ate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

Medical Secretary with nursing experience, seeks active post. Clear driving licence. French/Spanish.—Address, No. 351, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Beck microscope, model 22, for sale. 3 eyepieces (best ×15), 3 objectives (best ⅛); £21 or near offer.—FRE. 7183.

Consulting Room, furnished, with service, telephone service, receptionist, use waiting room; 1st floor.—50, Great Cumberland-place, Marble Arch, W.1. PAD. 7800.

Suite of Consulting-rooms in Grosvenor-square (just out of). Modern attractive building comprising ground and basement floors. Fully equipped X-ray rooms. Lease 75 years. Nominal ground rent. Immediate occupation. £11,000.—Sole agents: BLAKE & Co., 103, Mount-street, W.1. Tel.: Gro. 3761.

East Midlands County Town. Well situated, beautifully appointed, compact Nursing Home. Registered for 12 Beds. Pleasant grounds. Main services. Fully equipped. As going concern £5750.—Apply, S. V. EKINS & SON, F.A.I., St. Neots (Tel. 418), Huntingdonshire.

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DRINAMYL

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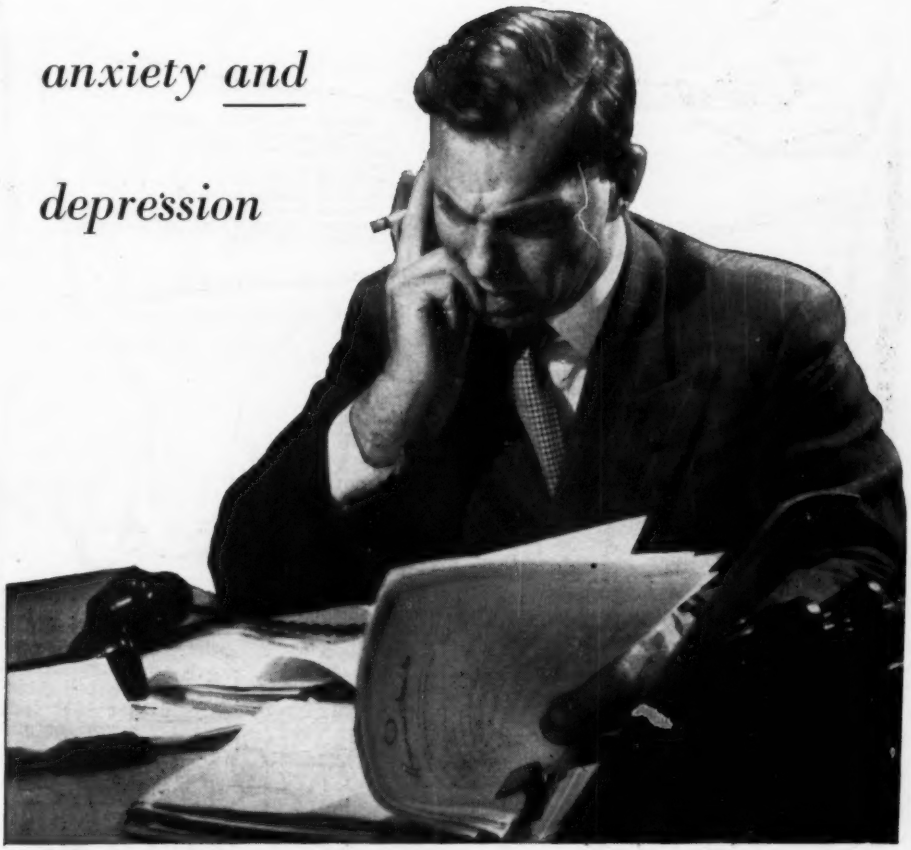

Drinamyl restores composure

Each 'Drinamyl' tablet contains 5 mg. 'Dexedrine' (dexamphetamine sulphate BPC) and 32 mg. (gr. ½) amylobarbitone.

Smith Kline & French Laboratories Ltd Coldharbour Lane, London SE5

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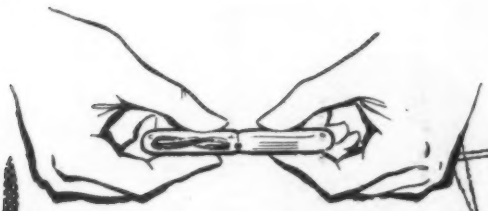
SUTURE NEWS!

L.H.C. now in non-splintering 'Spot' Tubes

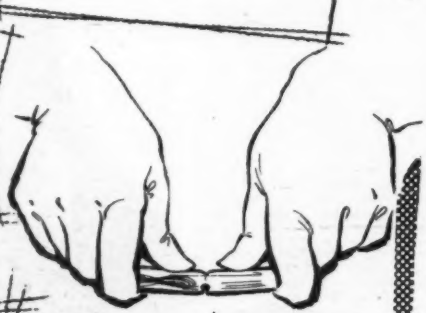


Believing in the present superiority of glass over other materials as the safest and most easily sterilised container available for sutures, The London Hospital Ligature Department has searched for some years for an improved glass tube that opens safely and cleanly.

We are pleased to announce that in the future, standard lines of L.H.C. will be packed in our new "Spot" Tubes.

The "Spot" Tube is the same as a normal suture tube, but replaces the conventional scored line with a groove around the middle, marked with a coloured spot.

Point spot vertically down towards bowl with thumbs uppermost and break as shown below. The thumbs, placed about ⅛" apart, must be exactly opposite to the spot to obtain a clean break; the tube breaks only away from the spot. Attempts to break the tube other than away from the spot will result in splintering.



With London Hospital's new "Spot" Tubes, no filing is needed, no instruments required and it is not even necessary to hold the tube in a swab.

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